

Name: Index No:

School: center No:

REPUBLIC OF SOUTH SUDAN
CENTRAL EQUATORIA STATE (CES) – JUBA
MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY
PRIMARY LEAVING EXAMINATION (P.L.E)
DECEMBER – 2024

SUBJECT: MATHEMATICS

TIME: $2\frac{1}{2}$ Hours

Answer all questions.

Question One.

A. Write the following in words.

(i) 4,780,342
**Four million, seven
hundred and eighty
thousand three hundred
and forty two.**

(ii) 72,354
**Seventy two thousand,
three hundred and fifty
four.**

B. i) Write the condition for the divisibility test by 3.

**A number is divisible by three if
the sum of its digits is divisible by
3.**

ii) Solve out if the number 450 is
divisible by 3.

$$\begin{array}{r} 150 \\ 3 \overline{) 450} \\ \underline{-3} \\ 150 \\ \underline{-15} \\ 0 \end{array}$$

Therefore 450 is divisible by 3.

C. List all the factors of the number 32.
1, 2, 4, 8, 16 and 32.

D. Workout the following

i) $(0.03)^2$
 $(0.03)^2 = 0.03 \times 0.03$
$$= \frac{3}{100} \times \frac{3}{100}$$
$$= \frac{9}{10000}$$
 $\underline{\underline{= 0.0009}}$

ii) $(4.5)^2$
 $= 4.5 \times 4.5$
$$= \frac{45}{10} \times \frac{45}{10}$$
$$= \frac{2025}{100}$$
 $\underline{\underline{= 20.25}}$

E. Using prime factorization method,
solve 64.

$$\begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$= \underline{\underline{2^6}}$$

F. Express $\frac{5}{6}$ as a percentage.

$$\text{Fraction} = \frac{5}{6}$$

$$\text{as \%} = \frac{5}{6} \times 100\%$$

$$= \frac{250}{3}$$

$$= 83\frac{1}{3}\%$$

G. Workout the following

$$(i) \quad \frac{3}{7} \times \frac{5}{8}$$

$$= \frac{15}{56}$$

$$(ii) \quad 16 \div \frac{4}{3}$$

$$= \frac{16}{1} \times \frac{3}{4}$$

$$= \underline{\underline{12}}$$

Question Two.

A. (i) The area of a rectangle is 24cm^2 .

What is the width if the length is 12cm ?

$$A = 24\text{cm}^2$$

$$L = 12\text{cm}$$

$$W = ?$$

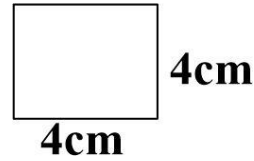
$$A = L \times W$$

$$\frac{24^2\text{cm}^2}{12\text{cm}} = \frac{12\text{cm} \times W}{12\text{cm}}$$

$$2 = W$$

$$\underline{\underline{\text{Width} = 2\text{cm}}}$$

(ii) Find the area of the square below.



$$A = S \times S$$

$$A = 4\text{cm} \times 4\text{cm}$$

$$\underline{\underline{A = 16\text{cm}^2}}$$

B. Convert the following

(i) 2500m into km

$$1\text{km} = 1000\text{m}$$

$$? = 2500\text{m}$$

$$\frac{1\text{km } 2500\text{m}}{1000\text{m}}$$

$$= \underline{\underline{2.5\text{km}}}$$

(ii) 300cm into meters

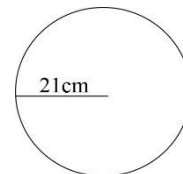
$$1\text{m} = 100\text{cm}$$

$$? = 300\text{cm}$$

$$\frac{1\text{m} \times 300\text{cm}}{100\text{cm}}$$

$$= \underline{\underline{3\text{m}}}$$

C. Find the circumference of the circle below.



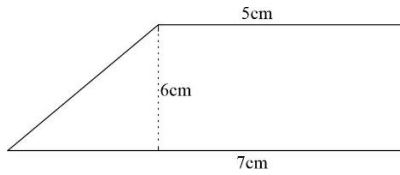
$$C = 2\pi r$$

$$= 2 \times \frac{22}{7} \times 21\text{cm}$$

$$= 44 \times 3\text{cm}$$

$$= \underline{\underline{132\text{cm}}}$$

- D. Calculate the area of the figure below.



$$A = \frac{1}{2}(a + b)h$$

$$A = \frac{1}{2}(5 + 7)6$$

$$A = \frac{1}{2} \times 12 \times 6$$

$$\underline{A = 36\text{cm}^2}$$

Question Three.

- A. If $x=5$, $y=2$, $w=1$ and $z=4$. Solve

$$\begin{aligned} \text{i)} \quad & \frac{2x3z}{yw} \\ &= \frac{2 \times 5 \times 3 \times 4}{2 \times 1} \\ &= \underline{60} \end{aligned}$$

$$\begin{aligned} \text{ii)} \quad & \text{Simplify } \frac{1}{2}(18x + 24y) - \frac{1}{4}(20x + 16y) \\ &= \frac{1}{2} \times 18x + \frac{1}{2} \times 24y - \frac{1}{4} \times 20x + \frac{1}{4} \times 16y \\ &= 9x + 12y - 5x - 4y \\ &= 9x - 5x + 12y - 4y \\ &= \underline{4x + 8y} \end{aligned}$$

- B. (i) A mother is 6 times older than her son. If their total sum of ages is 63, calculate the age of the son.

Let the son's age be y

$$\text{Mother} = 6 \times y$$

$$= 6y$$

$$\text{Sum } y + 6y = 63$$

$$\frac{7y}{7} = \frac{63}{7}$$

$$Y = 9$$

Son's age = 9 years

- (ii) In a class, there are 48 pupils. If the boys are three times the number of girls, how many girls are there?

Girls	Boys	Total
X	3x	48

$$X + 3x = 48$$

$$\frac{4x}{4} = \frac{48}{4}$$

$$X = 12$$

The number of girls is 12.

- C. What is the cardinal number of set A of the word APPLE?

$A = \{X: X \text{ is a letter in the word APPLE}\}$

$A = \{\text{letters of the word APPLE}\}$

$A = \{A, P, P, L, E\}$

$$n(A) = 5$$

the cardinal number of set A is 4.

- D. Given two sets

$$A = \{2, 4, 6, 8, 10, 12\}$$

$$B = \{1, 2, 3, 4, 5, 6, 7, 9, 11\}$$

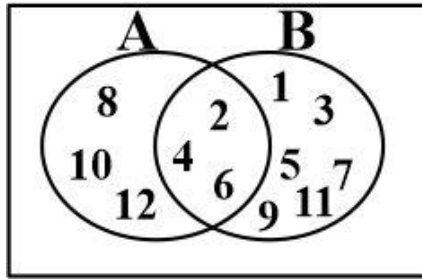
Find;

$$\begin{aligned} \text{(i)} \quad & A \cap B \\ & \text{Common} = 2, 4, 6 \end{aligned}$$

$$A \cap B = \{2, 4, 6\}$$

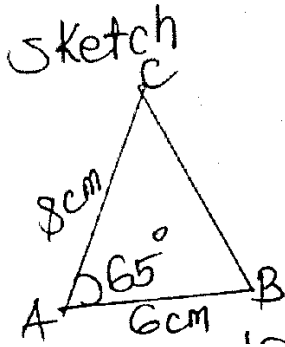
$$\begin{aligned} \text{(ii)} \quad & A \cup B \\ & = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\} \end{aligned}$$

- (iii) Draw a Venn diagram from two sets A and B above in D.

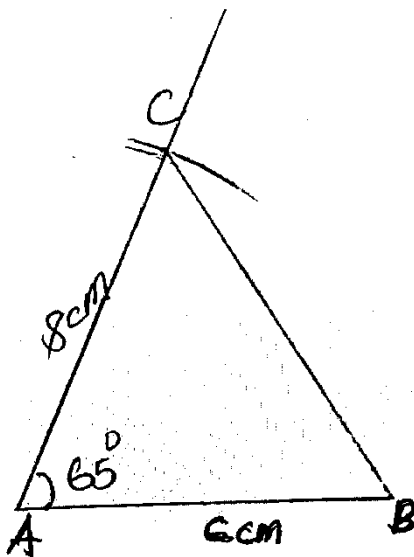


Question Four.

- A. Construct a triangle ABC where AB=6cm, AC=8cm and angle CAB=65°.



Accurate diagram.



- B. A right angled triangle has an area of 54cm. if its base is 12cm, calculate

- (i) Height

$$A = 54\text{cm}^2$$

$$b = 12\text{cm}$$

$$h = ?$$

$$A = \frac{1}{2}bh$$

$$54\text{cm}^2 = \frac{1}{2} \times 12\text{cm} \times h$$

$$\frac{54\text{cm}^2}{6\text{cm}} = \frac{6\text{cm}h}{6\text{cm}}$$

$$9\text{cm} = h$$

$$\text{Height} = 9\text{cm}$$

- (ii) Hypotenuse

$$\text{Hyp}^2 = b^2 + h^2$$

$$\text{Hyp}^2 = 12^2 + 9^2$$

$$\text{Hyp}^2 = 144 + 81$$

$$\text{Hyp}^2 = 225$$

$$\text{Hyp}^2 = 15^2$$

$$\text{Hypotenuse} = 15\text{cm}$$

- C. In a scale diagram, 1cm represents 50m.

- (i) Write the scale in ratio form.

$$1\text{cm} \quad 50\text{m}$$

$$50\text{m} \quad \text{cm}(50 \times 100)$$

$$= 5000\text{cm}$$

$$\text{Ratio form } 1\text{cm}:5000\text{cm}$$

$$= \underline{1:5000}$$

- (ii) Find the actual length in kilometers corresponding in a length of 8.5cm on the diagram.

$$\text{Scale} = 1:5000$$

$$\text{M.D} = 8.5\text{cm}$$

$$\text{Actual length} = \text{M.D} \times \text{scale}$$

$$= 5000 \times 8.5$$

$$= 42,500\text{cm}$$

$$42,500\text{cm to km}$$

$$\frac{42,500\text{cm}}{100,000\text{cm}}$$

$$= \underline{\underline{0.425 \text{ km}}}$$

- D. Construct a rhombus whose sides measure 6cm. the corresponding angles at E and F should measure 70° . Make EH and FG 6cm each, hence join GH.

Question Five

- A. A teacher gave examination to pupils on different days. One of the boys got his scores as below.

86,72,50,50,60,70.

Find the following;

- (i) The mode
Arrange in ascending order

50,50,60,70,72,86

Mode = 50

- (ii) The mean average
Let mean average be x

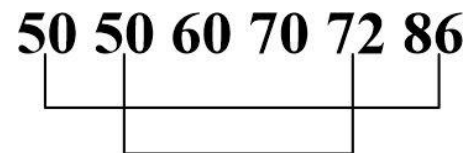
$$X = \frac{\sum x}{n}$$

$$= \frac{50+50+60+70+72+86}{5}$$

$$X = \frac{388}{5}$$

$$= \underline{\underline{77.6}}$$

- (iii) Median



$$= \frac{60+70}{2}$$

$$= \frac{130}{2}$$

$$= 65$$

Median = 65

- B. In a class there are 750 learners in 1st year, 420 learners in second year.
Draw a pie graph to represent the number of learners in these groups.

1st year = 750 learners

2nd year = 420 learners

Total = 750 + 420

= 1170 learners

1st year angle

$$= \frac{750}{1170} \times 360^\circ$$

$$= \frac{27000}{117}$$

$$= 230.0^\circ$$

$$= \underline{\underline{231^\circ}}$$

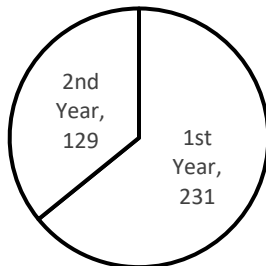
2nd year angle

$$\frac{420}{1170} \times 360^\circ$$

$$= \frac{15120}{117}$$

$$= 129.2$$

$$= \underline{\underline{129^\circ}}$$



- C. (i) What is the possible outcome of tossing a die once?

$$S = \{1, 2, 3, 4, 5, 6\}$$

$$n(S) = 6$$

6 possible outcomes

- (ii) Write the possible outcomes for a football match.

Teams A and B

S = {Team A wins (AB), Team B wins (BA), Draw (ABT) }

$$n(S) = 3$$

We have 3 possible outcomes.

Question Six.

- A. Martin was issued a loan of SSP 50,000 on simple interest. After 6 months, he paid back on interest of SSP 2500. At what rate was the loan issued?

$$P = 50,000$$

$$T = 6 \text{ months or } \frac{1}{2} \text{ year}$$

$$I = \text{SSP } 2500$$

$$R = ?$$

$$R = \frac{100I}{PT}$$

$$R = \frac{100 \times 2500}{50,000 \times 0.5}$$

$$R = \frac{5}{0.5}$$

$$= \underline{\underline{10\%}}$$

- B. Joseph is paid 5% commission on the sales he makes. One day he made a sale of SSP. 8600. How much commission was he paid?

$$\%com = 5\%$$

$$\text{Total sales} = 8600\text{SSP}$$

$$\text{Com} = \frac{\%com}{100\%} \times T.\text{sales}$$

$$= \frac{5\%}{100\%} \times 8600$$

$$\underline{\underline{\text{Com} = \text{SSP } 430}}$$

- C. Express the following sales in ratio form.

- i) 1cm represent 7m

$$1\text{cm} = 7\text{m}$$

$$7\text{m to cm } (7 \times 100)$$

$$= 700\text{cm}$$

$$\text{Ratio} = 1\text{cm}:700\text{cm}$$

$$\underline{\underline{= 1:700}}$$

- ii) 1cm represent 3km

$$1\text{cm} = 3\text{km}$$

$$3\text{km} = \text{cm } (3 \times 100,000)$$

$$= 300,000\text{cm}$$

$$\text{Ratio} = 1\text{cm}:300,000\text{cm}$$

$$\underline{\underline{= 1:300,000}}$$

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Answer all questions.

Question One (15marks)

- A. What is the total value of digit 2 in the number 920375?

2 x 10,000

Ans = 20,000.

- B. Write in words 1230047.

1, 230,047

Ans = One million, two hundred thirty thousand and forty-seven.

- C. Work out: $560459 - 2667$

560159

-2667

557792

- D. Deng Tong pays tax at the rate of 25% of his income. What is this percentage in fraction? Express your answer in simplest form.

$$25\% = \frac{25}{100}$$

$$\text{Ans} = \frac{1}{4}$$

- E. Work out:

i) $(27)^2$

$$27^2 = 27 \times 27$$

Ans = 729

ii) $6\frac{2}{3} \div 2\frac{1}{4}$

$$= \frac{20}{3} \div \frac{9}{4}$$

$$= \frac{20}{3} \times \frac{4}{9}$$

$$= \frac{80}{27} = 2\frac{26}{27} \text{ or } 2.96$$

- F. What qualifies a number to be divisible by 5?

The number either ends with 0 or 5.

- G. Use prime factorization method to solve

$$\begin{array}{r|l} 2 & 784 \\ \hline 2 & 392 \\ \hline 2 & 196 \\ \hline 2 & 98 \\ \hline 7 & 49 \\ \hline 7 & 7 \end{array}$$

$$\underline{2 \times 2 \times 2 \times 2 \times 7 \times 7 = 784}$$

- H. A piece of a commodity rose from SSP 50,000 to SSP 70,000. What percentage increase is this?

$$\begin{aligned} \text{Percentage increase} &= \frac{\text{New amount} - \text{original amount}}{\text{original amount}} \times 100\% \\ &= \frac{70000 - 50000}{50000} \times 100\% \\ &= \frac{20000}{50000} \times 100\% \\ &= \frac{200}{5} \end{aligned}$$

$$\underline{\text{Percentage increase} = 40\%}$$

Question Two: (15marks)

- A. Make the following changes

- i) 2 litres to millilitres

$$1\text{ltr} = 1000\text{ml}$$

$$2\text{ltr} = x$$

$$= 2 \times 1000\text{ml}$$

$$\underline{\text{Ans} = 2000\text{ml}}$$

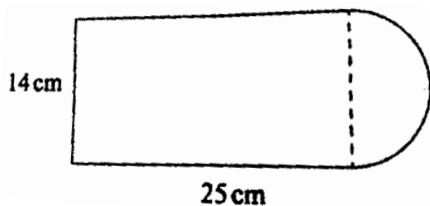
- ii) 2000cm^3 to m^3

$$1,000,000\text{cm}^3 = 1\text{m}^3$$

$$2000\text{cm}^3 = ?$$

$$\begin{aligned} &= \frac{2,000}{1,000,000} \\ &= \underline{\underline{0.002\text{m}^3}} \end{aligned}$$

- B. Find the area of the figure below made of a rectangle and a semicircle.



$$\text{area} = \text{area of rectangle} + \text{area of semi-circle}$$

$$A = L \times W + \frac{1}{2}\pi r^2$$

$$\begin{aligned} A &= 25\text{cm} \times 14\text{cm} \\ &\quad + \frac{1}{2} \times \frac{22}{7} \times 7\text{cm} \times 7\text{cm} \end{aligned}$$

$$\text{Area} = 350\text{cm}^2 + 77\text{cm}^2$$

$$\text{Area} = 427\text{cm}^2$$

- C. A cuboid has a base area of 60cm^2 . find its height if the volume is 180cm^3 .

$$\text{Volume} = L \times W \times H$$

$$\frac{180\text{cm}^3}{60\text{cm}^2} = \frac{60\text{cm}^2 h}{60\text{cm}^2}$$

$$\underline{\underline{h = 3\text{cm}}}$$

- D. Find the surface area of a cylindrical cup whose base radius is 8cm and height 25cm. ($\pi=3.14$)

$$\text{Surface area} = \pi r^2 + \pi dh$$

$$\pi = 3.14$$

$$r = 8\text{cm}$$

$$d = 2r = (2 \times 8\text{cm}) = 16\text{cm}$$

$$\begin{aligned} \text{Surface Area} &= 3.14 \times 8\text{cm} \times 8\text{cm} + \\ &\quad 3.14 \times 16\text{cm} \times 25 \end{aligned}$$

$$= 200.96\text{cm}^2 + 1,256\text{cm}^2$$

$$\text{Surface Area} = \underline{\underline{1456.96\text{cm}^2}}$$

- E. If a car travels 400m in 20 seconds, how fast is it going? Give your answer in km/her.

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$= \frac{400\text{m}}{20\text{s}}$$

$$\text{speed} = 20\text{m/s}$$

$$1\text{km} = 1000\text{m}$$

$$1\text{hr} = 3600\text{s}$$

$$20\text{m/s} = 20 \div \frac{1000\text{km/hr}}{3600}$$

$$= 20 \times \frac{3600}{1000} \text{km/hr}$$

$$= 2 \times 36\text{km/hr}$$

$$\text{Speed} = \underline{72\text{km/hr}}$$

Question Three: (15marks)

A. Simplify the following algebraic expressions:

i) $2p + q - p + 4q + p$

$$2p + q - p + 4q + p$$

Collect the like terms

$$2p + p - p + q + 4q$$

$$= \underline{2p + 5q}$$

ii) $3(6x - 5) + 4(2x - 3)$

$$3(6x - 5) + 4(2x - 3)$$

$$18x - 15 + 8x - 12$$

Collect the like terms

$$18x + 8x - 15 - 12$$

$$= \underline{26x - 27}$$

B. i) If, $g = 8$, $h = 7$ and $f = 5$. What is the value of $3g + 5f - f$?

$$3g + 5f - f$$

$$\text{But } g=8, h=7, f=5$$

$$(3 \times 8) + (5 \times 5) - 5$$

$$24 + 25 - 5 = \underline{44}$$

ii) Solve the equation $2n + 8 = 10$

$$2n + 8 = 10$$

$$2n + 8 - 8 = 10 - 8$$

$$\underline{n = 1}$$

C. list the numbers of the following sets.

i) A = a set of all even numbers less than 12.

$$\underline{\text{Set A} = \{2, 4, 6, 8, 10\}}$$

ii) B = set of vowel letters in the word REPUBLIC.

$$\underline{\text{Set B} = \{E, I, U\}}$$

iii) F = the set of all factors of 18.

$$\underline{F = \{1, 2, 3, 6, 9, 18\}}$$

iv) H = {X: X is multiple of 4 and 130}

The question is not set well. Free marks.

D. A mother is 6 times older than her son. The sum of their ages is 63 years. Determine the age of the mother.

Son	mother	sum
x	6x	63

$$x + 6x = 63$$

$$\frac{7x}{7} = \frac{63}{7}$$

$$X = 9$$

$$\text{Mother} = 6x$$

$$X = 6 \times 9$$

$$\text{Mother} = \underline{54 \text{ years old}}$$

- E. There are 150 learners in Primary Seven sitting some examinations if not all of the following examinations: English, Mathematics and Science. 15 pupils are sitting for both English and Mathematics but not Science, 20 pupils are sitting for both Science and English but not mathematics, 18 pupils are sitting for both science and mathematics but not English, 8 pupils are sitting for all the three examinations, 65 are sitting science in total, 55 are sitting English in total, 72 are sitting Mathematics in total. Using a Venn diagram, how many pupils did not sit for any of these examinations?

$$n(E) = 150$$

$$EnM = 15$$

$$SnE = 20$$

$$SnM = 18$$

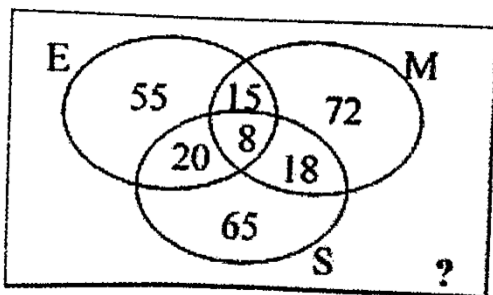
$$n(s) = 65$$

$$n(M) = 72$$

$$n(E) = 55$$

$$EnMnS$$

Venn diagram



Let those who sat for none be x

English

$$E + 15 + 8 + 20 = 55$$

$$E + 43 = 55$$

$$\underline{E=12}$$

Mathematics

$$M + 15 + 8 + 18 = 72$$

$$M = 72 - 41$$

$$\underline{M = 31}$$

Science

$$S + 20 + 8 + 18 = 65$$

$$S + 46 = 65$$

$$\underline{S = 19}$$

Those who sat for none

$$X + E + M + S + 15 + 8 + 20 + 18 = 150$$

$$X + 12 + 31 + 19 + 15 + 8 + 20 + 18 = 150$$

$$X + 123 = 150$$

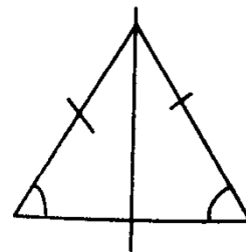
$$\underline{X = 27}$$

Question Four (20marks)

- A. i) What is line of symmetry?

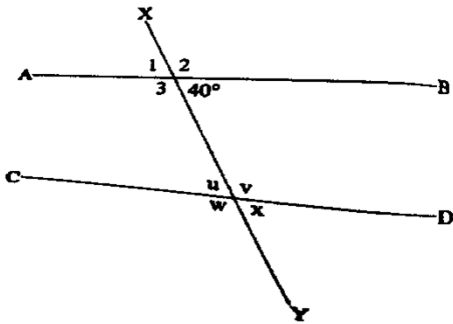
Is a line that cuts a shape exactly in half.

- ii) How many lines of symmetry does an isosceles triangle have?



Isosceles triangle has two equal sides, two equal angles and 1 line of symmetry.

- B. In the figure below, ABCD and XY is transversal.



Write “True” or “False” and give a reason transversal for your answer in the following statements X.

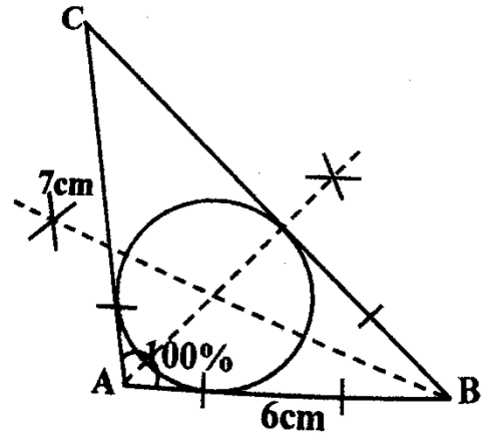
- i) $\angle 1 = 40^\circ$
(True)
 $\angle 1$ is vertically opposite to 40° and vertically opposite angles are equal to each other.
- ii) $\angle v + 40^\circ = 180^\circ$
(True)
 $\angle v + 40^\circ = 180^\circ$ because is co-interior angle.
- iii) $\angle u + 40^\circ = 180^\circ$
(False)
 Because angle $\angle u$ is alternate to 40°
- iv) $\angle x = 40^\circ$
(True)
 $\angle x$ is corresponding to 40°
- v) $\angle w + \angle u = 180^\circ$
(True)
 An interior angle and an exterior angle sum up to 180°

- C. Construct triangle ABC in which line $AB = 6\text{cm}$, $CA = 7\text{cm}$ and angle $BAC = 100^\circ$. Draw an inscribing circle to touch all the three sides of the triangle. Measure and give the radius of the circle.

$AB = 6\text{cm}$

$CA = 7\text{cm}$

$BAC = 100^\circ$



- D. A painter used a ladder to paint a wall of a story building which was 24m high. The ladder was placed 7m away from the wall. What was the height of the ladder?

Using Pythagoras theorem

$$\text{Hyp}^2 = \text{Base}^2 + \text{Height}^2$$

$$\text{Hyp}^2 = 7^2\text{m} + 24^2\text{m}$$

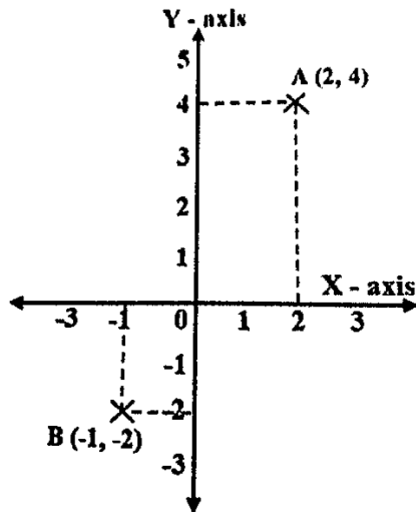
$$\text{Hyp}^2 = 49\text{m} + 576\text{m}$$

$$\text{Hyp}^2 = 625\text{m}$$

$$\sqrt{\text{Hyp}^2} = \sqrt{625}$$

$$\text{Hyp} = \underline{25\text{m}}$$

- E. plot the points A(2,4) and B(-1, -2) in the cartesian plane below.

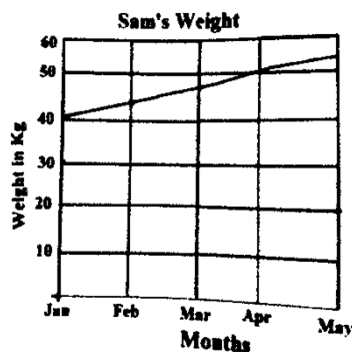


Question Five: (20marks)

A. list any three ways of representing collected data.

- Pie chart
- Histogram
- Bar graph
- Line graph
- Table

B. The graph below shows Sam's weight between January and May. Use it to answer the following questions.



- i) What is the title of the graph?
Sam's weight
- ii) What is the scale on the vertical axis?

16kg

iii) What was his weight in January?

40kg

iv) In which month did he weigh 50kg?

April

v) Did Sam's weight increase or decrease over?

Sam's weight increases over time.

C. A tailor made 10 dresses of the following lengths: 62cm, 42cm, 38cm, 40cm, 38cm, 53cm, 38cm, 41cm, 50cm and 61cm. Find the following;

i) Mode

The number which appears most

Mode = 38cm

ii) Median length

Median is a number in the middle

38cm, 38cm, 38cm, 40cm, 41cm, 42cm, 50cm, 61cm, 62cm

Median = 41cm

iii) Mean length

Mean = $\frac{\text{sum of items}}{\text{Total number of items}}$

$$= \frac{(38 + 38 + 38 + 40 + 41 + 42 + 50 + 61 + 62)}{9}$$

$$= \frac{410}{9}$$

Mean length = 45.6cm

D. In a box, there are 5 red balls and 5 green balls mixed together. What is the probability of picking a green ball if taken at random?

Total number of balls = $5+5 = 10$.

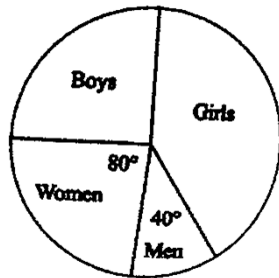
$$N(S) = 10$$

$$N(E) = 5$$

$$P(E) = \frac{n(E)}{n(s)} = \frac{5}{10}$$

$$P(E) = \frac{1}{2}$$

- E. The population of an estate in a town represented by the pie-chart below.



- i) What angle represent girls in the pie chart above?

Let girls = x

$$X + 90^0 + 80^0 + 40^0 = 360^0$$

$$X + 210^0 = 360^0$$

$$X + 210^0 - 210^0 = 360^0 - 210^0$$

$$X = \underline{150^0}$$

- ii) If there were 600 girls, how many more boys than men were there?

Let the total number = X

$$\frac{150}{360} \times X = 600$$

$$\frac{150x}{360} = \frac{600}{1}$$

$$\frac{150^0 x}{150^0} = \frac{360^0 \times 600^0}{150^0}$$

$$x = \frac{360^0 \times 600^0}{150^0}$$

$$x = 1440$$

$$\text{No. of boys} = \frac{90}{360} \times 1440$$

$$= \frac{1 \times 1440}{4}$$

$$= \underline{360 \text{ boys}}$$

$$\text{No. of men} = \frac{40}{360} \times 1440$$

$$= \frac{4 \times 1440}{36}$$

$$= \frac{5760}{36} = 160 \text{ men}$$

$$\text{Difference} = 360 - 160$$

$$= \underline{200 \text{ more boys.}}$$

Question Six: (15marks)

- A. John bought bicycle for SSP 3390 and sold it to his friend Laku for SSP 3820.

- i) Did he make a profit or loss by selling the bicycle?

Profit as the selling price is more than the buying price.

- ii) How much is the loss or profit?

$$P = S.P - B.P$$

$$P = \text{SSP } 3820 - \text{SSP } 3390$$

$$P = \underline{\text{SSP } 430}$$

- B. Nadia is paid on commission of 9% on the value of goods sold. In one month, she sold goods worth SSP 150,000. What was her commission in SSP?

$$\text{Commission \%} = 9\%$$

$$\text{Commission} = 9\% \times \text{sales}$$

$$= \frac{9}{100} \times 150,000 \text{ SSP}$$

$$= \frac{9 \times 150,000 \text{ SSP}}{100}$$

$$= \underline{\underline{\text{SSP } 13,500}}$$

- C. Yugusuk deposited SSP 32,000 with the Bank for 1 year at an interest rate of 12% p.a.

- i) How much interest did he earn at the end of the year?

$$P = 32000 \text{ SSP}$$

$$R = 12\% \text{ p.a}$$

$$T = 1 \text{ year}$$

$$\text{Interest} = ?$$

$$\text{From } S.I = \frac{PRT}{100}$$

$$S.I = 32000 \times \frac{12}{100} \times 1$$

$$S.I = 320 \times 12 \times 1$$

$$I = \underline{\underline{3,840 \text{ SSP}}}$$

- ii) Calculate the total amount he will get from the bank at the end of the year.

$$\text{Amount} = \text{Interest} + \text{Principal}$$

$$\text{Amount} = 3840 + 32000$$

$$\text{Amount} = \underline{\underline{35840 \text{ SSP}}}$$

- D. i) Write the scale below in ratio form. (1cm represent 50m)

$$1 \text{ cm represents } 50 \text{ m}$$

$$1 \text{ m} = 100 \text{ cm}$$

$$50 \text{ m} = (50 \times 100) \text{ cm}$$

$$= 5,000 \text{ cm}$$

Therefore, 1cm represents 50m is written as 1:5,000 (as a ratio)

- ii) A road is represented on a map by 3cm. What is the actual length of the road in kilometers if the scale used is 1:125000?

$$1 \text{ cm represents } 125000 \text{ cm}$$

But

$$100,000 \text{ cm} = 1 \text{ km}$$

$$125,000 \text{ cm} = ?$$

$$\frac{125,000 \text{ cm} \times 1 \text{ km}}{100,000 \text{ cm}}$$

$$\frac{125 \text{ km}}{100} = 1.25 \text{ km}$$

$$1 \text{ cm represents } = 1.25 \text{ km}$$

$$3 \text{ cm represents } = ?$$

$$= \frac{3 \text{ cm} \times 1.25 \text{ km}}{1 \text{ cm}}$$

$$= 3 \times 1.25 \text{ km}$$

$$= 3.75 \text{ km}$$

**** THE END ***

Name: Index No:

School: center No:

REPUBLIC OF SOUTH SUDAN
CENTRAL EQUATORIA STATE (CES) – JUBA
MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY
PRIMARY LEAVING EXAMINATION (P.L.E)
DECEMBER – 2022

SUBJECT: MATHEMATICS

TIME: $2\frac{1}{2}$ Hours

Answer all questions

Question One (15marks)

A. What is the place of digit 3 in?

i) 835007

The place of 3 is ten thousand.

ii) 158253

The place of 3 is ones.

B. Write the following numbers in words:

i) 25,307,101

Twenty-five million, three hundred and seven thousand one hundred and one.

ii) 65,005,637

Sixty-five million and five thousand six hundred thirty-seven.

C. Workout:

i) 5934701

+ 354926

6289627

ii)

$$\begin{array}{r} 3793 \\ \times 234 \\ \hline 15172 \\ 11379 \\ +7586 \\ \hline \hline 887562 \end{array}$$

D. Find the prime factors of:

i) 36

$$\begin{array}{c|c} 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline \end{array}$$

2x2x3x3

ii) 24

$$\begin{array}{c|c} 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline \end{array}$$

2x2x2x3

E. Find the square root of 169.

$$\sqrt{169} = \begin{array}{r|l} 13 & 169 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

$$= 13 \times 13$$

$$= \underline{13}$$

F. Write 34% as a fraction and simplify

$$\frac{34}{100} = \frac{17}{50}$$

G. Which of the following numbers are divisible by 3 and why?

i) 243

Number	Divisibility	Why?
243	Yes	2+4+3=9 (9 is a multiple of 3)

ii) 4721

Number	divisibility	Why?
4721	No	4+7+2+1=14 (14 is not multiple of 3)

Question Two (15marks)

A. i) Express 250 millimeters in meters.

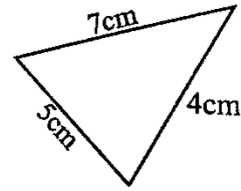
$$1000\text{mm} = 1\text{m}$$

$$250\text{mm} = y$$

$$\frac{100y}{1000} = \frac{250}{1000}$$

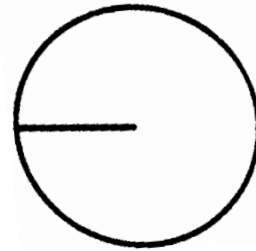
$$\underline{y = 0.25\text{m}}$$

ii) Find the perimeter of the triangle below.



$$= 5+7+4 = \underline{16\text{cm.}}$$

B. Find the circumference of the triangle below take $\pi = \frac{22}{7}$



$$C = 2\pi r$$

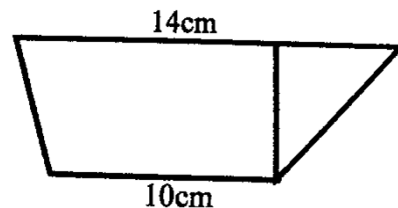
$$\text{But } r=14\text{cm and } \pi=\frac{22}{7}$$

$$C = 2 \times \frac{22}{7} \times 14$$

$$C = 2 \times \frac{22}{7} \times 2$$

$$= \underline{88\text{cm}}$$

C. Find the area of a trapezium below.



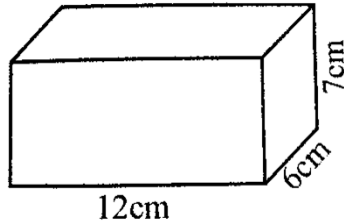
$$A = \frac{a+b}{2} \times h$$

$$A = \frac{14+10}{2} \times h$$

$$A = \frac{24}{2} \times h$$

$$\underline{A = 12h}$$

D. Find the volume of the figure below.



$$\text{Volume} = L \times W \times H$$

$$V = 12 \times 6 \times 7$$

$$V = 504\text{cm}^3$$

Question Three (15marks)

- A. i) A father is five times the age of the daughter. If the sum of their ages is 42years, find the age of the daughter.

Father	Daughter	Total age
5y	y	42

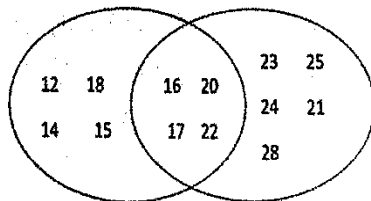
$$5y + y = 42$$

$$\frac{6y}{6} = \frac{42}{6}$$

$$y = 7$$

The daughter is 7years old.

- ii) Below is the Venn diagram list the items in set A and set B.



Set A = {12, 14, 15, 16, 17, 18, 20, 22}

Set B = {16, 17, 20, 21, 22, 23, 24, 25}

B. If W=3, X=2 and Y=0. Find the value of:

$$\begin{aligned} \text{i)} \quad & \frac{W^2 X^3}{x} \\ &= \frac{3 \times 3 \times 2 \times 2 \times 2}{2} \\ &= \frac{72}{2} \\ &= \underline{\underline{36}} \end{aligned}$$

$$\begin{aligned} \text{ii)} \quad & \frac{4x + y}{w} \\ &= \frac{3 \times 2 + 0}{3} \\ &= \frac{6}{3} \\ &= \underline{\underline{2}} \end{aligned}$$

C. Solve the simultaneous equation below.

$$4y + 2x = 6$$

$$2y + 2x = 4$$

$$\begin{array}{r} 4y + 2x = 6 \\ - \quad 2y + 2x = 4 \\ \hline \end{array}$$

$$2y + 0 = 2$$

$$2y = 2$$

$$\frac{2y}{2} = \frac{2}{2}$$

$$y = 1$$

Substitute the value of y in equation (i) $4y + 2x = 6$

$$4 \times 1 + 2x = 6$$

$$4 - 4 + 2x = 6 - 4$$

$$2x = 2$$

$$\underline{\underline{X = 1}}$$

- D. i) If x is a set of all counting numbers from 1-9 and y is a set of all multiples of 2 up to 8. List all the

elements of set x and y. hence find x n y.

$$X = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$Y = \{2, 4, 6, 8\}$$

$$X \cap Y = \{2, 4, 6, 8\}$$

ii) Simplify $2(2xy + 2) - 4(xy + 3)$

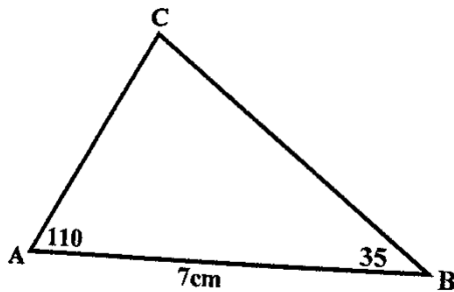
$$4xy + 4 - 4xy - 12$$

$$4xy - 4xy + 4 - 12$$

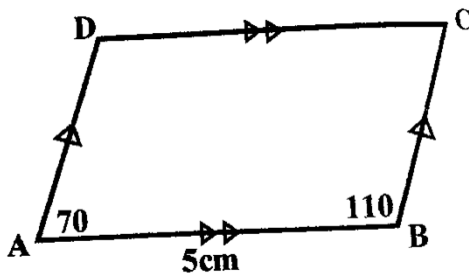
$$= \underline{8}$$

Question Four (20marks)

- A. Construct a triangle ABC in which angles $\angle ABC = 35^\circ$ and angle $\angle BAC = 110^\circ$, line $AB = 7\text{cm}$.



- B. Construct a parallelogram ABCD. Where $AB = 5\text{cm}$ and angle $\angle ABC = 110^\circ$ and $\angle DAB = 70^\circ$



- C. i) Find the base of the right-angled triangle whose height is 8cm hypotenuse 10cm.

$$a^2 + b^2 = c^2$$

$$8^2 + b^2 = 10^2$$

$$64 + b^2 = 100$$

$$64 - 4 + b^2 = 100 - 64$$

$$b^2 = 36$$

$$\underline{b = 6}$$

ii) Calculate its area

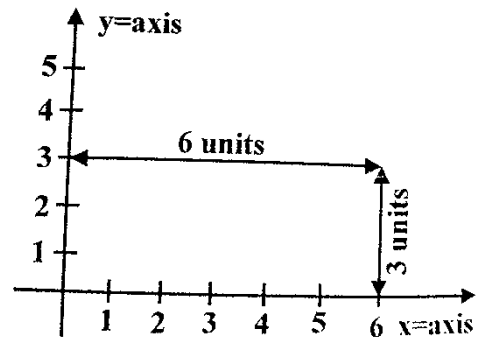
$$A = \frac{1}{2} b \times h$$

$$A = \frac{1}{2} \times 6 \times 8$$

$$A = 3 \times 8$$

$$\underline{A = 24\text{cm}^2}$$

- D. Plot the points 6 and 3 on a Cartesian plain, where 6 units long and 5 units up.

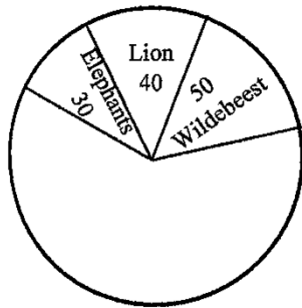


Question Five (20marks)

- A. Write down the four methods of representing a data.

- ✓ Pie chart
- ✓ Histogram
- ✓ Line graph
- ✓ Bar graph
- ✓ Table

- B. The pie chart below shows the 10800 animals in a certain park.



$$X + 30 + 40 + 50 = 360$$

$$X + 120 = 360$$

$$X + 120 - 120 = 360 - 120$$

$$X = 240$$

- i) How many more Gazelles than wildebeests are there in the park?

$$\text{Gazelles} = \frac{240}{360} \times 10800$$

$$240 \times 30$$

$$= 7,200$$

- ii) Wildebeests

$$= \frac{240}{360} \times 10800$$

$$5 \times 30 = 150$$

$$7,200 - 150$$

$$= 7,050$$

- C. The weight of 5 boys is 45kg, 37kg, 41kg and 39kg. find the mean weight.

$$\text{Mean} = \frac{45+37+41+39}{4}$$

$$= \frac{162}{4}$$

$$= 40.5$$

- D. A standard 8 pupil scored the following marks in exams 80, 78, 64, 60, 65, 76, 78, 43. Find;

- i) The mode

$$= 78$$

- ii) The median

43, 60, 64, 65, 76, 78, 78, 80

$$= \frac{65 + 76}{2}$$

$$= \frac{141}{2}$$

$$= 70.5$$

- iii) The mean

$$= \frac{43+60+64+65+76+78+80}{8}$$

$$= \frac{544}{8}$$

$$= 68$$

Question Six (15marks)

- A. Peter bought a bed whose mark price was SSP15,000. If he bought it for SSP13,910. What was his discount allowed for the bed?

$$\text{Marked price} = 15,000$$

$$\text{Buying price} = 13,900$$

$$\text{Discount} = \text{M.P} - \text{B.P}$$

$$= 15,000 - 13,910$$

$$\text{Discount} = 1,090\text{SSP}$$

- B. Express the following in ratio form

- i) 1cm represents 20m.

$$1\text{m} = 100\text{cm}$$

$$20\text{m} = y$$

$$Y = 2000\text{m}$$

Therefore, 1cm represents
20m in ratio is written as
1:2000m.

$$= \underline{\underline{1240ssp}}$$

THE END!

- ii) 1cm represents 9km.
 $1m = 100cm$ $1000m = 1km$
 $1km = (100 \times 100) = 100,000$
 $9km = 900,000km$

Therefore, 1cm
representing 9km can
written as 1:900,000cm.

- C. Calculate the amount and the
compound interest at the principal of
8000SSP, where it has 10% per
annum, for the duration of

- (i) For the first year

$$\text{Principle} = 8000ssp$$

$$\text{Time} = 1\frac{1}{2} \text{ years}$$

$$\text{Rate} = 10\%$$

$$\text{Interest} = P \times T \times R$$

$$I = 8000 \times 1 \times \frac{10}{100}$$

$$I = \frac{80,000}{100}$$

$$\underline{\underline{I = 800SSP}}$$

- (ii) For the second year

$$\text{New principal} = 8000 + 800 = 8800ssp$$

$$I = 8800 \times 0.5 \times \frac{10}{100}$$

$$= \frac{44,000}{100}$$

$$\underline{\underline{= 440}}$$

Compound interest

$$= 800 + 440$$

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DECEMBER – 2021

SUBJECT: MATHEMATICS

TIME: $2\frac{1}{2}$ Hours

Answer all questions

Question One (15marks)

A. Round off to the nearest thousandth.

i) 7421

7,000

ii) 6657

7,000

iii) 8716

9,000

B. Write down the condition of the divisibility test by 2, 3, 4 and 9.

i) A number is divisible by 2 if the last number or ends with zero.

ii) A number is divisible by 3 if the sum of the digit is divisible by 3.

iii) A number is divisible by 4 if the last digit is divisible by 4.

iv) A number is divisible by 9 if the sum of the digit is divisible by 9.

C. What is the place value of digit 3 in the following?

i) 53267

Thousands

ii) 65263

Ones

iii) 687321

Hundreds

D. Express the following ratios in the simplest form.

i) 3:9

1:3

ii) 2:4

1:2

iii) 3:6

1:2

iv) 48:24

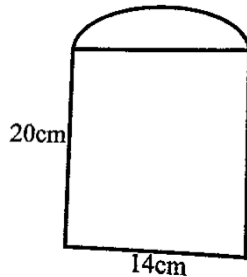
2:1

E. Workout 3793×234

$$= \underline{887,562}$$

Question Two (15marks)

A. Find the area of the shape below.



$$\text{Area} = \frac{\pi r^2}{2} \text{ (area of the semi-circle)}$$

$$= \frac{22}{7} \times 7 \times \frac{1}{2} = 77\text{cm}^2$$

$$\text{Area} = L \times W$$

$$= 14\text{cm} \times 20\text{cm}$$

$$= 280\text{cm}^2$$

$$\text{Total area} = 77 + 280$$

$$= \underline{357\text{cm}^2}$$

B. Convert the following

i) 2.5km to metres

$$1\text{km} = 1000\text{m}$$

$$2.58\text{km} = 1000 \times 2.58$$

$$= \underline{2580\text{m}}$$

ii) 90850cm to metres

$$100\text{cm} = 1\text{m}$$

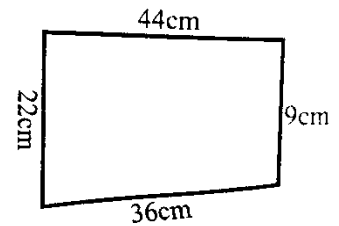
$$90850\text{cm} = \frac{90850}{100}$$

$$= \underline{908.5\text{m}}$$

iii) Define perimeter

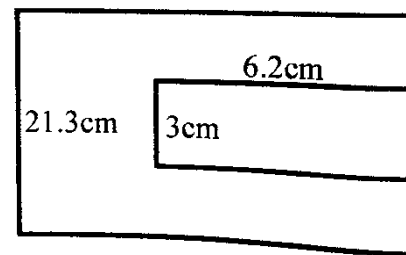
It is the distance all around a closed figure.

iv) Find the perimeter of the figures below.



$$P = (44\text{cm} + 22\text{cm} + 36\text{cm} + 9\text{cm})$$

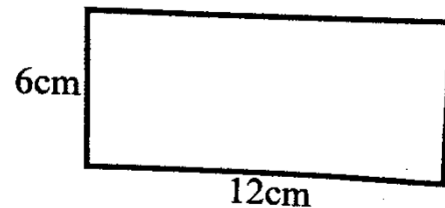
$$P = \underline{111\text{cm}}$$



$$P = (6.2 + 3 + 10.5 + 21.3) \text{ cm}$$

$$P = \underline{41\text{cm}}$$

C. Find the area of the rectangle below.



$$\text{Area} = L \times W$$

$$\text{Area} = 6\text{cm} \times 12\text{cm}$$

$$\underline{\text{Area} =}$$

D. Find the area of a circle whose circumference is 88cm.

$$\text{Area} = 2\pi r$$

$$= 2 \times \frac{22}{7} \times r = 88$$

$$r = \frac{288 \times 7}{44}$$

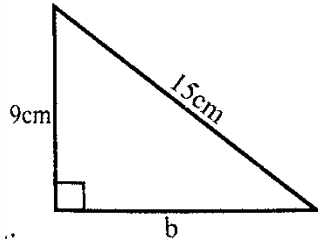
$$= \underline{14\text{cm}}$$

E. Write down the formula for π .

$$\pi = \frac{\text{circumference}}{\text{diameter}}$$

Question Three (15marks)

A. Find the value of “b” in the figure below.



$$a^2 + b^2 = c^2$$

$$9^2 + b^2 = 15^2$$

$$81 + b^2 = 225$$

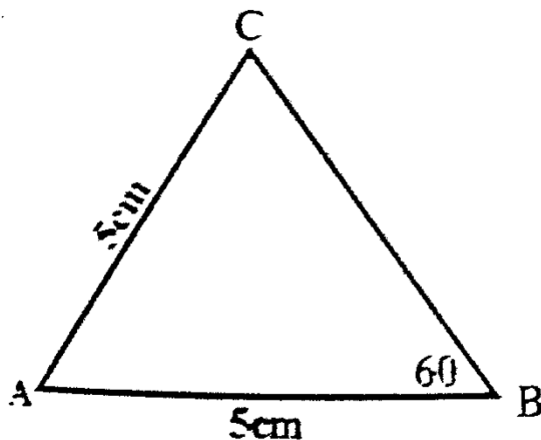
$$b^2 = 225 - 81$$

$$b^2 = 144$$

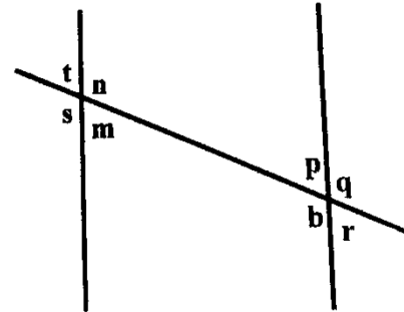
$$\sqrt{b^2} = \sqrt{144}$$

$$\underline{b = 12\text{cm}}$$

B. Construct an isosceles triangle ABC, where AC = BC = 5cm and angle ABC = 60°.



C. Use the diagram below to complete the statement.



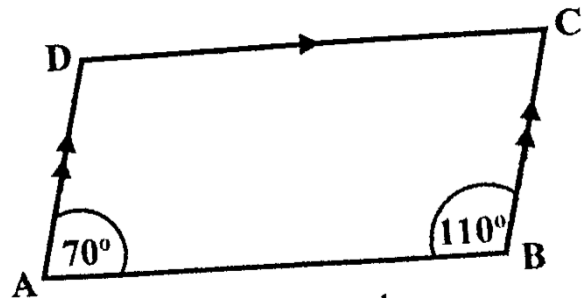
(i) Angle s is alternate to angle b.

(ii) Angle t is alternate to angle p.

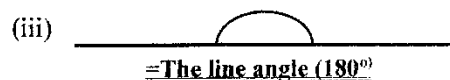
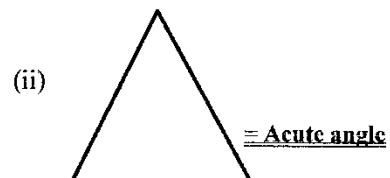
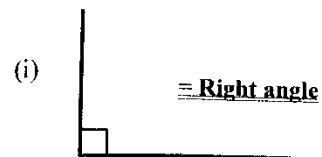
(iii) Angle n = angle q

(iv) Angle m = angle t.

D. Construct a parallelogram ABCD where AB = 6cm, BC = 5cm, ABC = 110° and DAB = 70°.



E. Name the following angles.



Question Four (20marks)

- A. i) Simplify: $6x + 4y - 3x + 2y$

$$6x + 4y - 3x + 2y$$

$$6x - 3x + 4y + 2y$$

$$\underline{3x + 2y}$$

ii) A farmer has 40 animals in his farm. The number of goats is thrice the number of cows. How many cows does the farmer have?

Let the number of cows be x .

Therefore, goats = 3

Total = 40 animals

$$3x + x = 40$$

$$\frac{4x}{4} = \frac{40}{4}$$

$$\underline{x = 10}$$

- B. Find the value of $\frac{3(a^2 - c^2)}{2(a^2 + b^2)}$ if $a = 10$, $b = 1$, $c = 8$ and $d = 2$.

$$\frac{3(10^2 - 8^2)}{2(2^2 + 1^2)} = \frac{3(100 - 64)}{2(4 + 1)}$$

$$\frac{3(36)}{2(5)} = \frac{108}{10}$$

$$\underline{= 10.8} \text{ or } = 10 \frac{8}{10}$$

- C. Solve the simultaneous equation below.

$$4y + 2x = 6$$

$$-2y + 2x = 4$$

$$4y + 2x = 6 \dots\dots\dots(1)$$

$$-2y + 2x = 4 \dots\dots\dots(2)$$

Subtracting eqn. 2 from eqn. 1

$$4y + 2x = 6$$

$$\underline{-2y + 2x = 2}$$
$$2y + 0 = 2$$

$$\frac{2y}{2} = \frac{2}{2}$$

$$\underline{y = 2}$$

- D. i) Using a set notation, list the elements of set "A" whose members are even numbers greater than 8 and less than 20.

$$A = \underline{\{10, 12, 14, 16, 18\}}$$

- E. Describe the set "B" in two ways.
 $B = \{2, 4, 6, 8\}$

✓ **Set B is a set of even numbers up to 8.**

✓ **Set of the multiples of two up to 8.**

- F. James is 20 years younger than his father Peter. If their total age is 28 years.

- i) How old is James?

Let James' age be y .

His father's age = $(y + 20)$

Their total age = $(y + y + 20) = 28$

$$2y + 20 = 28$$

$$2y = 28 - 20$$

$$\frac{2y}{2} = \frac{8}{2}$$

$$y = 4$$

James is 4 years old.

- ii) How old is his father, Peter?

James' age = 4

$$\text{His father's age} = 4 + 20 \\ = 24$$

$$\text{His father's age} = \underline{24}$$

Question Five (20marks)

A. In an English test, 9 pupils score the following 13, 18, 13, 14, 13, 16, 14, 21, 13. Find

i) The mean

$$\text{Mean} = \frac{13+18+13+14+13+16+14+21+13}{9}$$

$$\text{Mean} = \frac{135}{9}$$

$$\text{Mean} = \underline{15.}$$

ii) The mode

$$= \underline{13}$$

iii) The median

$$13, 13, 13, 13, 14, 14, 16, 18, 21$$

$$\frac{N+1}{2} = \frac{9+1}{2} = \frac{10}{2} = 5$$

$$\text{Median} = \underline{14}$$

B. i) Define mode?

It is the most occurring frequency of a given data.

iii) Write down two properties of mode.

✓ **Mode does not change**

✓ **The data can have more than one mode**

C. List the three methods commonly known used in representation of statistical data.

✓ **Bar graph**

✓ **Line graph**

✓ **Pie chart**

Question Six (15marks)

A. Express the following in ratio form;

i) 1cm represent 2m

$$1\text{m} = 100\text{cm}$$

$$2\text{m} = (100 \times 2)$$

$$= 200\text{cm}$$

1cm representing 2m is written as 1:200 (as ratio)

ii) 1cm represent 1m

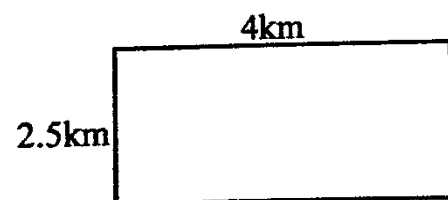
$$1\text{m} = 100\text{cm}$$

$$1000\text{m} = 1\text{km}$$

$$1\text{km} = (100 \times 1000)$$

$$= \underline{100,000\text{cm}}$$

B. i) Choose a suitable scale for the diagram below with scale 1:10,000.



The scale 1:100,000

$$2.5\text{km} = \frac{250,000}{100,000}$$

$$4\text{km} = (4 \times 100,000) = 400,000$$

$$400,000 = \frac{400,000}{100,000} = 4\text{cm}$$

$$1\text{km} = 100,000\text{cm}$$

$$= 2.5\text{cm}$$

$$4\text{km} = (4 \times 100,000)$$

$$\underline{\underline{= 4\text{cm}}}$$

ii) A rectangular plot measures 90m by 30m. Using suitable scale, draw the rectangular plot.

If the shape of the paper is 15cm

$$90 \div 15 = 6\text{cm}$$

$$30 \div 15 = 2\text{cm}$$



- C. Thomas borrowed a loan of 200ssp for 1 year. He paid simple interest at 12%. How much interest did he pay?

$$\text{S.I} = \text{P} \times \frac{r}{100} \times t$$

$$= 200 \times \frac{12}{100} \times 1$$

$$\underline{\underline{= 24\text{ssp.}}}$$

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REPUBLIC OF SOUTH SUDAN
CENTRAL EQUATORIA STATE (CES) – JUBA
MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY
PRIMARY LEAVING EXAMINATION (P.L.E)
DECEMBER – 2020

SUBJECT: MATHEMATICS

TIME: $2\frac{1}{2}$ Hours

Answer all questions

Question One (21marks)

A) What is the place value of the digit 4 in the following numbers?

i) 834007

Thousands

ii) 23410

Hundreds

B) Write the following numbers in figure or symbol.

i) Six hundred and fifty

650

ii) Seven million nine hundred thousand and three

7,900,003

C) Write 824654 in expanded form

8 0 0, 0 0 0
2 0, 0 0 0
4, 0 0 0
6 0 0
5 0
4
8 2 4, 6 5 4

D) Workout $289204 + 7453$

$$289204 + 7453 = \underline{296657}$$

E) List the factors of 12.

$$12 = \{1, 2, 3, 4, 6, 12\}$$

F) Find the $\sqrt{144}$

$$144 = 2 \times 72$$

$$2 \times 2 \times 36$$

$$2 \times 2 \times 2 \times 18$$

$$2 \times 2 \times 2 \times 2 \times 9$$

$$2 \times 2 \times 2 \times 2 \times 3 \times 3$$

$$2 \times 2 \times 3 = \underline{12}$$

G) Workout $3\frac{4}{9} + 5\frac{1}{3}$

$$3\frac{4}{9} + 5\frac{1}{3}$$

$$= 3 + 5\left(\frac{4}{9} + \frac{1}{3}\right)$$

$$= 3 + 5 + \frac{4 + 3}{9}$$

$$= 8\frac{7}{9}$$

H) i) Find the value of 4.32×3.6

$$1.32 \times 3.6 = 15.552$$

ii) Express the ratio 4:12 in its simplest form.

$$4:12$$

$$2:6$$

$$\underline{1:3}$$

Question Two (15marks)

A) Convert the following;

i) 3.58km to meter

$$1\text{km} = 1000\text{m}$$

$$= 3.58\text{km} \times 1000\text{m}$$

$$= \underline{3580}$$

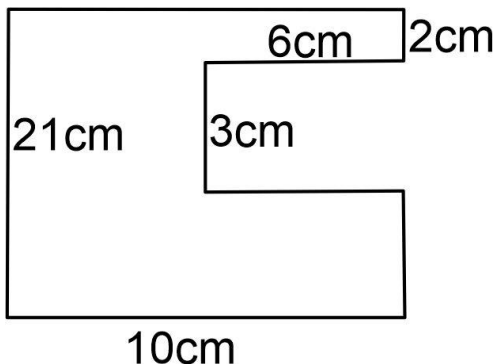
ii) 90850cm to meter

$$100\text{cm} = 1\text{m}$$

$$90850 =$$

$$= \underline{908.5\text{m}}$$

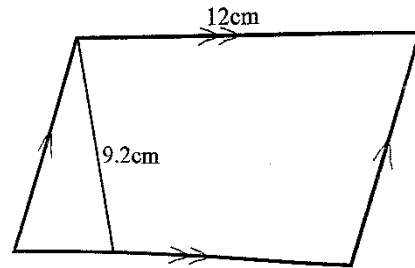
B) Find the perimeter of the figure below.



$$\text{Perimeter} = (21 + 10 + 2 + 6 + 3 + 6 + 2 + 10)$$

$$= \underline{62\text{cm}}$$

C) i) Find area of the figure below



The area of a parallelogram = base length x height

$$= (12 \times 9.2)$$

$$= \underline{110.4\text{cm}}$$

ii) From 8m cloth you can make 4 small shirts. How many small shirts can you make from 12m?

$$8\text{m} = 4 \text{ shirts}$$

$$1\text{m} \text{ makes } \frac{4}{8}$$

$$12\text{m} = \frac{4}{8} \times 12$$

$$= \underline{6 \text{ shirts}}$$

Question Three (15marks)

A) a triangle has an area of 15cm^2 . If its base is 12cm, calculate its

i) height

$$\text{area} = \frac{1}{2}bh$$

$$54 = \frac{1}{2} \times 12 \times h$$

$$54 = 6h$$

$$\underline{H=9}$$

ii) hypotenuse

$$\text{hyp}^2 = (b^2 + h^2)$$

$$\text{hyp}^2 = (12^2 + 9^2)$$

$$\text{hyp}^2 = 144 + 81$$

$$\text{hyp}^2 = 225$$

$$\text{hyp} = \sqrt{225}$$

$$= \underline{15\text{cm}}$$

- B) James has x goats. Peter has 4 times the number owned by James and Daniel has of then number owned by Peter.

- i) Form an equation indicating the total number owned by three men.

James has x cows

Peter has $X \times 4 = 4x$

Daniel has

The equation = $X + 4x + 2x$

- ii) Simplify the equation

$$X + 4x + 2x = \underline{7x}$$

- C) If $a=2$, $b=3$ and $c=5$. Find the value of $\frac{a^2b + c^2b}{c^2}$.

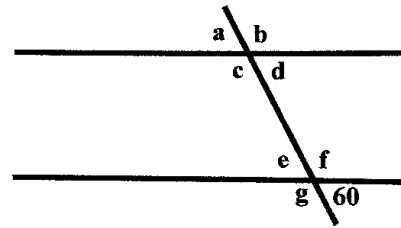
$$\begin{aligned} & \frac{2^2(3) + 5^2(3)}{5^2} \\ = & \frac{2 \times 2 \times 3 + 5 \times 5 \times 3}{5 \times 5} \\ = & \frac{12 + 75}{25} \\ = & \frac{87}{25} \\ = & \underline{3.48} \end{aligned}$$

- D) Using set notation, list the element of set A whose number are even numbers greater than 8 and less than 20.

$$\text{Set A} = \{10, 12, 14, 16, 18\}$$

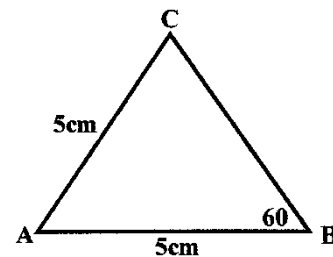
Question Four (20marks)

- A) State the size of the angle named "a" in the figure below.



$$\underline{\angle a = 60}$$

- B) Construct an isosceles triangle ABC where $AC=AB=5\text{cm}$ and angle $ABC=60$



- C) Victor drove from his home to an airstrip at a speed of 36km/hr. if he took 15 minutes to reach the destination, how far is the airstrip from his home?

$$\text{Speed} = 36\text{km}$$

$$\text{Time} = 15 \text{ minutes}$$

$$\text{Distance} = 36 \times \frac{15}{60}$$

$$= 36 \times \frac{1}{4}$$

$$= \underline{9\text{km}}$$

- D) (i) Find the circumference of a circle whose diameter is 14cm (taking π as

$$C = \pi d$$

$$\pi = \frac{22}{7} \quad D = 14\text{cm}$$

$$C = \frac{22}{7} \times 14\text{cm}$$

$$= 22 \times 2\text{cm}$$

$$= \underline{44\text{cm}}$$

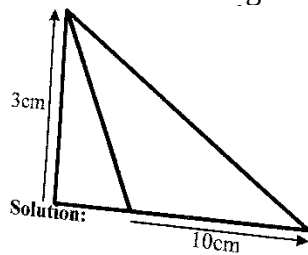
- E) The volume of a cuboid is 960cm^3 . If its height is 8cm , what is its base area?

$$\text{Volume} = \text{base area} \times \text{height}$$

$$\text{Base area} = \frac{960}{8}$$

$$= \underline{120\text{cm}^2}$$

- F) Find the area of the triangle below.



$$\text{Area} = \frac{1}{2} b \times h$$

$$= \frac{1}{2} \times 10 \times 3$$

$$= 1 \times 5 \times 3$$

$$= \underline{15\text{cm}^2}$$

Question Five (20marks)

- A) Define the following terms

- i) Mean

This is the sum of a given data divided by the number of the data.

- ii) Mode

It is the most occurring data.

- iii) Median

It is the middle number of a collection of data arranged in ascending or descending order.

- B) The following table shows English marks for 6 pupils in primary six in a certain school.

Name	James	Mary	Abraham	Jane	Elijah	Martha
Marks	85	65	45	75	80	85

Calculate

- i) The mean average mark

$$= \frac{85 + 65 + 45 + 75 + 80 + 85}{6}$$

$$= \frac{435}{6}$$

$$= \underline{72.5}$$

- ii) Mode

$$= 85$$

- C) In Moses' fruit farm 20% are oranges, 30% are pineapple, 40% are mangoes. Represent this information on a pie chart.

Oranges

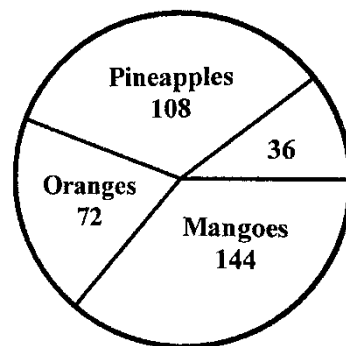
$$= \frac{200}{100} = \frac{1}{5} \times 360 = 72$$

Pineapples

$$= \frac{30}{100} = \frac{3}{10} \times 360 = 108$$

Mangoes

$$= \frac{40}{100} = \frac{4}{10} \times 360 = 144$$



Question Six (15marks)

- A) A lorry loaded with bags of maize. 25% bags were then added so that the load was 625kg. what was the original weight of the bags?

Original weight = 100%

Increase weight = 25%

New weight = 125%

125% = 625kg

$$1\% = \frac{625}{125}$$

$$100\% = \frac{625}{125} \times 100\%$$

= 500kg

- B) Complete the table below.

Scale	Actual length	Drawing length
1cm for 10m	54	5.4m
1cm for 5m		3.4m
1cm for 20m	110m	5.5m
1cm for 100m	480	4.8m

- C) Express the following in ratio form.

- i) 1cm represents 2m

$$1\text{m} = 100\text{cm}$$

$$2\text{m} = (2 \times 100)$$

$$= 200\text{cm}$$

1:200

- ii) 1cm represents 1km

$$1\text{m} = 100\text{cm}$$

$$1000\text{cm} = 1\text{km}$$

$$1\text{km} = (100 \times 1000)$$

$$= 10,000$$

= 1:10,000

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REPUBLIC OF SOUTH SUDAN
CENTRAL EQUATORIA STATE (CES) – JUBA
MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY
PRIMARY LEAVING EXAMINATION (P.L.E)

DECEMBER – 2019

SUBJECT: MATHEMATICS

TIME:

Answer all questions

Question One (21marks)

- a) Write 4,499 in words.

Four thousand four hundred and ninety nine.

- b) What is the place value of digit 3 in the number 835007?

Ten thousand

- c) Workout the following

(i) $-4 + (-4) =$

$= -4 + -4$

$= -4 - 4$

$= -8$

(ii) $477 - 32 + 9$

$477 - 32 + 9$

$= 445 + 9$

$= 454$

- d) Workout the G.C.F of 12, 18 and 3.

F12 = {1,2,3,4,6,12}

F18 = {1,2,3,6,9,18}

F3 = {1,3}

The GCF of 12, 18 and 3 = 3

e) Workout: $3\frac{1}{2} + 2\frac{1}{2} - 1\frac{1}{2}$

$= (3+2+1) + \frac{1}{2} + \frac{1}{4} + \frac{1}{3}$

$= 4 + \frac{6+3-4}{12}$

$= 4\frac{5}{12}$

- f) Workout $14.48 - 13.16 + 6.12$

14.48

- 13.16

01.32

+ 6.12

= 7.44

- g) In Torit East Primary School, there are 16 girls and 48 boys. Calculate the percentage of girls in Torit East Primary School.

No. of girls = 16 no. of boys = 48

total no. = 64

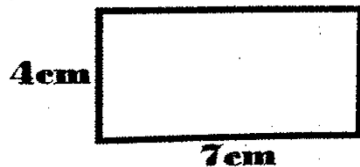
$$\% \text{age of girls} = \frac{\text{no of girls}}{\text{total no}} \times 100\%$$

$$= \frac{16}{64} \times 100\%$$

$$\% \text{age of girls} = \underline{\underline{25\%}}$$

Question Two (22marks)

- a) Find the perimeter of the rectangle below.



$$\text{Perimeter} = 2(L+W)$$

$$= 2(7\text{cm}+4\text{cm})$$

$$= 2(11\text{cm})$$

$$= \underline{\underline{22\text{cm}}}$$

- b) The area of triangle field is 36m^2 . Find the height of the field given that its base is 8m.

$$\text{Given that area} = 36\text{m}^2$$

$$\text{Base} = 8\text{m}$$

$$\text{Height} = ?$$

$$\text{Area} = \frac{1}{2} \times b \times h$$

$$36\text{m}^2 = \frac{1}{2} \times 8\text{m} \times h$$

$$\frac{36\text{m}^2}{4} = \frac{4}{4} \text{height}$$

$$\underline{\underline{\text{Height} = 9\text{m}}}$$

- c) Change 4300g into kg.

$$1000\text{g} = 1\text{kg}$$

$$4300\text{g} = \frac{4300\text{g}}{1000\text{g}} \times 1\text{kg}$$

$$= \frac{43}{10} \text{kg}$$

$$= 4\frac{3}{10} \text{kg} \text{ or } \underline{\underline{4.3\text{kg}}}$$

- d) Poni bought a bag for 4,800SSP. After being given a discount of 200SSP.

- (i) What was the marked price of the bag?

$$\text{Marked price} = \text{buying price} + \text{discount}$$

$$\text{M.P} = 4,800\text{SSP} + 200\text{SSP}$$

$$\text{M.P} = \underline{\underline{5,000\text{SSP}}}$$

- (ii) Calculate the percentage discount.

$$\% \text{age discount} = \frac{\text{discount}}{\text{M.P}} \times 100\%$$

$$= \frac{200\text{SSP}}{5000\text{SSP}} \times 100\%$$

$$= \underline{\underline{4\%}}$$

- e) Tom travelled at speed of 3km/her for 7 hours. Find the distance he covered.

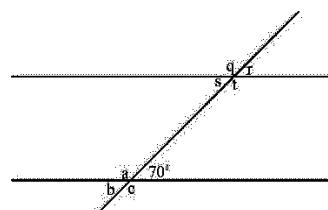
$$\text{Distance} = \text{speed} \times \text{time}$$

$$= 3\text{km/hr} \times 7\text{hr}$$

$$= \underline{\underline{21\text{km}}}$$

Question Three (16marks)

- a) In the diagram below state the sizes of angles marked q, r, s and t.



First find "a"

$$a + 70^\circ = 180^\circ$$

$$a + 70^\circ - 70^\circ = 180^\circ - 70^\circ$$

$$\text{angle } a = 110^\circ$$

$q = 110^\circ$ correspond to angle a

$r = 70^\circ$ correspond to angle 70°

$s = 70^\circ$ alternate to angle 70°

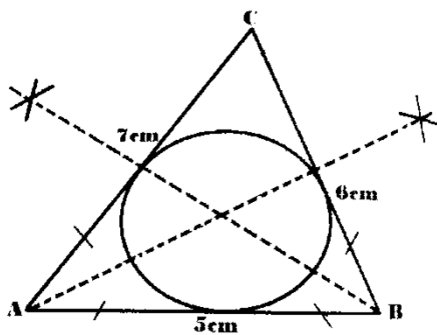
$t = 110^\circ$ alternate to angle a

- b) i) Draw a triangle ABC, where AB = 5cm, BC = 6cm and AC = 7cm. inscribe a circle inside the triangle such that it touches the three sides of the triangle.

$$AB = 5\text{cm}$$

$$BC = 6\text{cm}$$

$$AC = 7\text{cm}$$

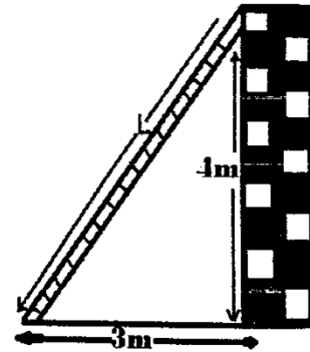


- ii) Measure and state the radius of the circle.

$$\text{Radius} = 1.6\text{cm or } 1.7\text{cm}$$

- c) A ladder leans against a vertical wall as shown on the diagram below. If the distance of the foot of the ladder from the wall is 3m, and the ladder

leans at the high of 4m, find the length (L) of the ladder.



Using $\text{base}^2 + \text{height}^2 = \text{hypo}^2$

$$3\text{m}^2 + 4\text{m}^2 = L^2$$

$$9\text{m} + 16\text{m} = L^2$$

$$25\text{m} = L^2$$

$$\sqrt{L^2} = \sqrt{25}$$

$$\underline{L = 5\text{m}}$$

Question Four (20marks)

- a) If $a=3$, $b=5$ and $c=2$. Evaluate $2b + 4a + c$.

$$= 2 \times b + 4 \times a + c$$

$$= 2 \times 5 + 4 \times 3 + 2$$

$$= 10 + 12 + 2 = \underline{24}$$

- b) Solve the equation $3x + 7 = 25$.

$$= 3x + 7 - 7 = 25 - 7$$

$$\frac{3x}{3} = \frac{18}{3}$$

$$\underline{= 6}$$

- c) Solve the simultaneous equations below.

$$3y - 5x = 4$$

$$-y + 5x = 2$$

Use SSS and DSA

$$3y - 5x = 4$$

$$+ -y + 5x = 2$$

$$2y + 0 = 6$$

$$\frac{2y}{2} = \frac{6}{2}$$

$$\underline{Y=3}$$

From equation $3y - 5x = 4$

$$3 \times 3 - 5x = 4$$

$$9 - 5x = 4$$

$$-5x = 4 - 9$$

$$\frac{-5x}{-5} = \frac{-5}{-5}$$

$$\underline{X = 1}$$

$$\underline{Y = 3 \text{ and } X = 1}$$

- d) In a group of 22 tourists who visited South Sudan. 12 visited Imatong Mountain (I) and 11 visited Fulla falls (F). All the tourists visited at least a site.

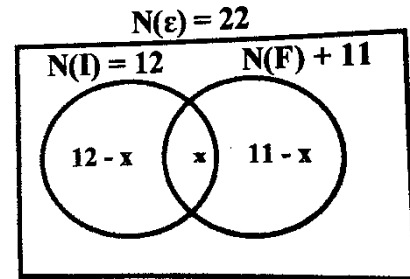
- (i) Draw a Venn diagram to represent the information above. (Use x to represent the number of tourists who visited both sites)

$$N(\Sigma) = 22$$

$$N(I) = 12$$

$$N(F) = 11$$

$$N(I \cap F) = x$$



- (ii) Calculate the number of tourists who visited both Imatong Mountain and Fulla falls.

$$12 - x + x + 11 - x = 22$$

$$12 + 11 - x = 22$$

$$23 - x = 22$$

$$-x = 22 - 23$$

$$\frac{-x}{-1} = \frac{-1}{-1} \quad X = 1$$

$$\underline{N(I \cap F) = 1}$$

Question Five

- a) Nine candidates scored the following marks in a mathematics test. 20, 27, 39, 23, 27, 31, 19, 17, 24. State the

- (i) Range

$$\text{Range} = 20, 27, 39, 23, 27, 31, 19, 17, 24$$

$$\text{Re-arrange} = 17, 19, 20, 23, 24, 27, 27, 31, 39$$

$$= \text{Big No.} - \text{small No.}$$

$$= 39 - 17$$

$$\underline{\text{Range} = 22}$$

- (ii) Mode

Mode = 17, 19, 20, 23, 24, 27, 27, 31, 39

Mode = the most common Number

Mode = 27

(iii) Median

Median = 17, 19, 20, 23, 24, 27, 27, 31, 39

Median = the middle no.

Median = 24

(iv) Mean

Mean = $\frac{\text{total amount}}{\text{number of items}}$

Mean = $\frac{17+19+20+23+24+27+27+31+39}{9}$

Mean = $\frac{227}{9}$

Mean = $25\frac{2}{9}$ Or 25.22

b) The traffic department in Juba recorded the number of vehicles (Cars, Buses, and Lorries) travelling from Juba City to Bor Town in one day as shown on the table below.

(i) Draw a pie chart to represent the above information.

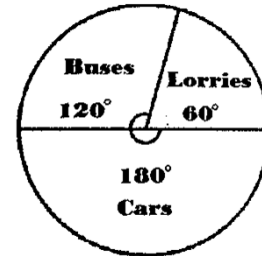
Vehicles	Number
Cars	18
Buses	12
Lorries	6

Total no. of vehicles = $18+12+6=36$

$$\text{Cars} = \frac{18}{36} \times 360^\circ = 180^\circ$$

$$\text{Buses} = \frac{12}{36} \times 360^\circ = 120^\circ$$

$$\text{Lorries} = \frac{6}{36} \times 360^\circ = 60^\circ$$



(ii) If a vehicle travelling from Juba to Bor had an accident that day, what is the probability that it was a lorry?

$$\text{Prob} = \frac{\text{expected outcome}}{\text{sample space}}$$

$$\text{Prob} = \frac{\text{lorry}}{\text{car}+\text{bus}+\text{lorry}}$$

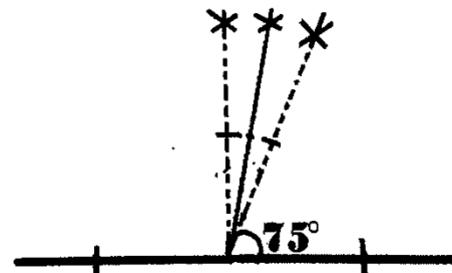
$$= \frac{6}{18+12+6} = \frac{6}{36}$$

$$\text{Probability} = \frac{1}{6}$$

Question Six (6marks)

Using a ruler, pencil and pair of compasses only, draw an angle of 75° .

- (i) First construct an angle of 90°
- (ii) Then construct an angle of 60°
- (iii) Bisect an angle of 60° and 90° to get an angle of 75°



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CENTRAL EQUATORIA STATE (CES) – JUBA
MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY
PRIMARY LEAVING EXAMINATION (P.L.E)

DECEMBER – 2018

SUBJECT: MATHEMATICS

TIME:

Answer all questions

Question One (21marks)

- a) Write 4,830 in words.

Four thousand eight hundred and thirty.

- b) Workout $4507 + 307$

$$\begin{array}{r} 4507 \\ + 307 \\ \hline 4814 \end{array}$$

- c) Write 14 in Roman Numerals.

$$10 = x$$

$$4 = iv$$

$$\underline{14 = xiv}$$

- d) Workout: $-10 - (-4)$

$$= -10 - (-4) \text{ remove the bracket}$$

$$= -10 + 4$$

$$\underline{= -6}$$

- e) In Buluk Primary School, there are 340 pupils, if 238 are girls, how many boys are in Buluk Primary School?

$$\text{Number of pupils} = 340$$

$$\text{Number of girls} = 238$$

$$\text{Number of boys} = 340 - 238$$

$$\text{Number of boys} = \underline{102}$$

- f) Workout

1) $14.67 - 13.48 + 6.12$

Subtract first

$$\begin{array}{r} 14.67 \\ - 13.48 \\ \hline 1.19 \end{array}$$

Add 1.19 to 6.12

$$\begin{array}{r} 1.19 \\ + 9.12 \\ \hline 7.31 \end{array}$$

2) $4\frac{3}{5} + 3\frac{2}{15} + 2$

$$= (4+3+2) + \frac{3}{15} + \frac{2}{15}$$

$$= (9) + \frac{9+2}{15}$$

$$= 9\frac{11}{15}$$

g) Express $\frac{1}{4}$ as percentage

$$= \frac{1}{4} \times 100\%$$

$$= \underline{25\%}$$

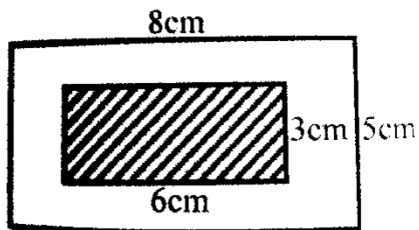
h) Write 0.5 as a fraction.

$$0.5 = \frac{5}{10}$$

$$= \frac{1}{2}$$

Question Two (9marks)

a) Find the area of the unshaded region in the figure below.



Area of outer rectangle = L x W

$$= 8\text{cm} \times 5\text{cm}$$

$$= \underline{40\text{cm}^2}$$

Area of inner rectangle = L x W

$$= 6\text{cm} \times 3\text{cm}$$

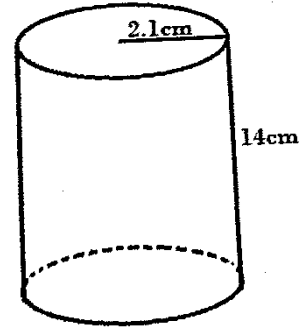
$$= 18\text{cm}^2$$

Area of unshaded region = area of outer – area of inner

$$= 40\text{cm}^2 - 18\text{cm}^2$$

$$= \underline{22\text{cm}^2}$$

b) Calculate the volume of the cylinder below (take π as $\frac{22}{7}$)



$$\text{Volume} = \pi r^2 h$$

$$= \frac{22}{7} \times 2.1\text{cm}^2 \times 14\text{cm}$$

$$= \frac{22}{7} \times 2.1\text{cm} \times 2.1\text{cm} \times 14\text{cm}$$

$$= 22 \times 2.1\text{cm} \times 2.1\text{cm} \times 2\text{cm}$$

$$= \underline{194.04\text{cm}^3}$$

Question Three (24marks)

a) Ochan bought 20 litres of honey at 8,000ssp. If he later sold it at 500ssp per litre, what was his: -

i. Total selling price?

$$\text{Number of litres} = 20\text{litres}$$

$$\text{Amount per litre} = 500\text{ssp}$$

$$\text{Total selling} = \text{litres} \times \text{selling price}$$

$$\text{Total selling price} = 20 \times 500\text{ssp}$$

$$\text{Total selling price} = \underline{10,000\text{ssp}}$$

ii. Profit

$$\text{Profit} = \text{selling price} - \text{buying price}$$

$$\text{Buying price} = 8,000\text{ssp}$$

$$\text{Selling price} = 10,000\text{ssp}$$

$$\text{Profit} = 10,000\text{ssp} - 8,000\text{ssp}$$

$$\underline{\text{Profit} = 2000\text{ssp}}$$

iii. What was her percentage profit?

$$\% \text{age profit} = \frac{\text{profit}}{\text{buying price}} \times 100\%$$

$$\% \text{age profit} = \frac{2000_{ssp}}{8000_{ssp}} \times 100\%$$

$$\% \text{age profit} = \underline{25\%}$$

b) Mary is 5 years older than Poni. If their total age is 25 years, how old is;

1. Mary?

Let Mary's age be x

Poni's age be $x - 5$

Their total age = $x + x - 5 = 25$

$$2x - 5 = 25$$

$$2x = 25 + 5$$

$$\frac{2x}{2} = \frac{30}{2}$$

$$\underline{X=15}$$

Mary's age = 15 years.

2. Poni?

Poni's age = $x - 5$

$$X = 15$$

$$= 15 - 5$$

$$= \underline{10}$$

Poni's age is 10 years

c) Solve the simultaneous equations below.

$$3y + 5x = 6$$

$$3y + x = 2$$

Use SSS and DSA

$$3y + 5x = 6$$

$$3y + x = 2$$

$$\underline{0 + 4x = 4}$$

$$\frac{4x}{4} = \frac{4x}{4}$$

$$X = 1$$

From equation $3y + 5x = 6$

$$3y + 5(1) = 6$$

$$3y = 6 - 5$$

$$\frac{3y}{3} = \frac{1}{3}$$

$$Y = \frac{1}{3}$$

Therefore, $x=1$ and $y=\frac{1}{3}$

d) If $a=6$, $b=2$. Find the value of $4(2a+2b)$

$$= 4(2 \times a + 2 \times b)$$

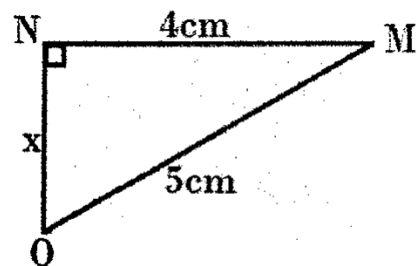
$$= 4(2 \times 6 + 2 \times 2)$$

$$= 4(12 + 4)$$

$$= 4(16)$$

$$\underline{= 64}$$

e) Find the length of the side of the triangle marked x in the figure below.



$$\text{Use } NO^2 + NM^2 + MO^2$$

$$= x^2 + 4cm^2 = 5cm^2$$

$$X^2 = 16cm = 25cm$$

$$X^2 = 25cm - 16cm$$

$$\sqrt{x^2} = \sqrt{9cm}$$

$$\underline{X = 3cm}$$

Question Four (19marks)

- a) List the prime factors of 36.

$$36 = \begin{array}{r|l} 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

Prime factors of 36

$$= \underline{2 \times 2 \times 3 \times 3}$$

$$\text{Or } = \underline{2^2 \times 3^2}$$

- b) Convert 0.125 tons into kilograms

$$1 \text{ tonne} = 1,000kg$$

$$0.125 = \frac{0.125 \text{ tonnes} \times 1000kg}{1 \text{ tonne}}$$

$$= 0.125 \times 1000kg$$

$$= 125kgs$$

- c) An athlete runs 200m in 20 seconds.
Find his average speed in;

- 1) m/s

$$\text{speed} = \frac{\text{distance}}{\text{time taken}}$$

$$= \frac{200m}{20seconds}$$

$$\underline{\text{Speed} = 10m/s}$$

- 2) km/hr

$$1000m = 1km$$

$$200m = \frac{200m \times 1km}{1000m}$$

$$= \frac{200}{1000} km$$

$$3600sec. = 1hour$$

$$20sec. = \frac{20sec. \times 1hr}{3600sec.} =$$

$$\frac{20}{3600} hour$$

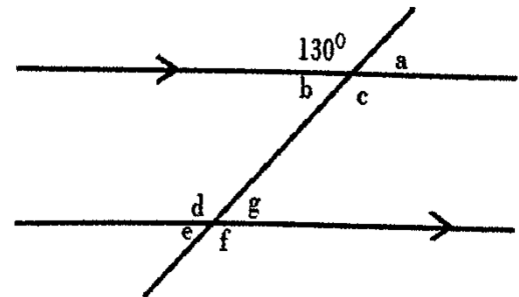
$$\text{Speed} = \frac{\text{distance}}{\text{time taken}}$$

$$\text{Speed} = \frac{200}{1000} km \div \frac{20}{3600} hour$$

$$\text{Speed} = \frac{200}{1000} km \times \frac{3600}{20} hour$$

$$\underline{\text{Speed} = 36km/hr}$$

- d) In the diagram below state the sizes of angles marked g and f.



First find "a"

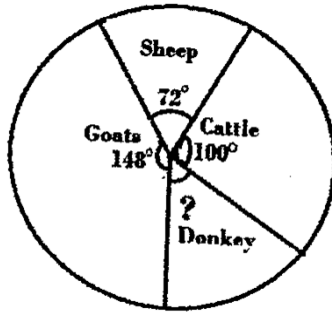
$$\text{Angle } a = 180^\circ - 130^\circ = 50^\circ$$

(supplementary angle)

$$g = 50^\circ \text{ (corresponding to a)}$$

$$\text{angle } f = 130^\circ \text{ (corresponding to a)}$$

e) The pie chart below shows the number of animals in a farm. If there are 10 donkeys in the farm find;



- 1) The angle represented by the number of donkeys.

Let the angle of donkey be x

$$X + 100^{\circ} + 72^{\circ} + 148^{\circ} = 360^{\circ}$$

$$X + 320^{\circ} = 360^{\circ}$$

$$X = 360^{\circ} - 320^{\circ}$$

$$X = 40^{\circ}$$

The angle represented by donkey is 40°

- 2) The total number of all the animals in the farm.

Let the total number of animals be x.

The number of donkeys = 10

$$= \frac{40}{360} \times X = 10$$

$$360 \times \frac{40}{360} \times X = 10 \times 360$$

$$\frac{40x}{40} = \frac{3600}{40}$$

$$X = 90$$

The number of animals = 90

- 3) The number of sheep in the farm.

$$\text{Number of sheep} = \frac{72}{360} \times 90$$

$$\text{Number of sheep} = 18$$

Question Five (16marks)

- a) A teacher gave an English test to 5 pupils and they obtained the following scores 70, 45, 70, 55, 50. Find:

- 1) Mean score

$$\text{Mean} = \frac{\text{total amount}}{\text{no. of items}}$$

$$\text{Mean} = \frac{70+45+70+55+50}{5}$$

$$\text{Mean} = \frac{290}{5}$$

$$\text{Mean} = 58$$

- 2) Modal score

70, 45, 70, 55, 50

Re-arrange the numbers

Mode = 45, 50, 55, 70, 70

$$\text{Mode} = 70$$

- 3) Median score

70, 45, 70, 55, 50

Re-arrange the numbers

Median = 45, 50, 55, 70, 70

$$\text{Mean} = 55$$

- b) In Yambio Primary School, there are 20 teachers. 12 teach mathematics (M) while 10 teach English (E). Given all the teachers teach at least one of the two subjects, find the number of teachers who teach both mathematics and English, hence

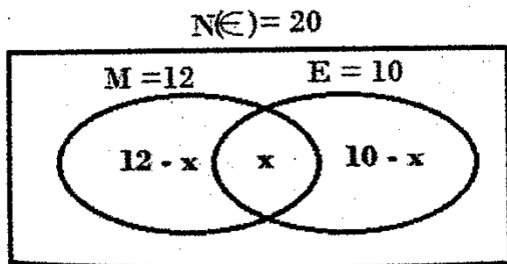
draw a Venn diagram to represent the relationship between set “M” and “E”.

$$N(\Sigma) = 20$$

$$M=12$$

$$E=10$$

$$(M \cap E) = ?$$



$$12 - x + x + 10 - x = 20$$

(collect like terms)

$$12 + 10 - x = 20$$

$$22 - x = 20$$

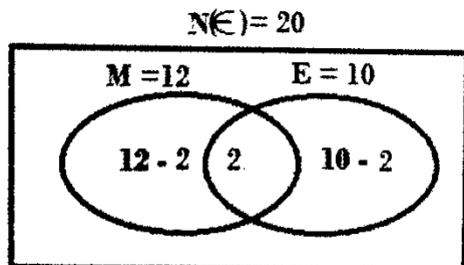
$$-x = 20 - 22$$

$$\frac{-x}{-1} = \frac{-2}{-1} \text{ both sides by negative}$$

$$x = 2$$

$$(M \cap E) = 2 \text{ teachers}$$

Hence part



- c) A box contains 6 red balls and 4 green balls mixed together. Morbe draws one ball at random from the box. What is the probability that he will draw a green ball?

$$\text{Probability} = \frac{\text{chance}}{\text{total outcome}}$$

$$= \frac{\text{green}}{\text{red} + \text{green}}$$

$$= \frac{4}{6 + 4}$$

$$= \frac{4}{10}$$

$$\text{Probability} = \frac{2}{5}$$

Question Six (11marks)

- a) A salesman is paid 5% commission on the sales he makes. One day he made a sale of SSP 9,600. How much commission was he paid?

$$\text{Commission} = 5\% \text{ of } 9,600\text{SSP}$$

$$\text{Commission} = \frac{5}{100} \times 9,600\text{SSP}$$

$$\text{Commission} = \underline{480\text{SSP}}$$

- b) The marked price of a cup in a certain shop was SSP30. After bargaining, Nyandeng bought the cup at SSP25. Calculate her:

- 1) Discount

$$\text{Discount} = \text{market price} - \text{buying price}$$

$$\text{Discount} = \text{SSP}30 - \text{SSP}25$$

$$\text{Discount} = \underline{\text{SSP}5}$$

- 2) Percentage discount

$$\% \text{age disc} = \frac{\text{discount}}{\text{marked}} \times 100\%$$

$$= \frac{SSP5}{SSP30} \times 100\%$$

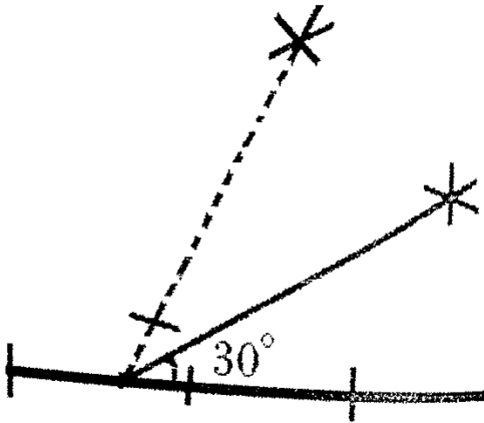
$$= \frac{50}{3} \%$$

$$\%age\ disc = 16\frac{2}{3} \% \text{ Or } \underline{\underline{16.7\%}}$$

- c) Using a pair of compasses, a ruler and a pencil only, construct an angle of 30° .

First construct an angle of 60°

Divide an angle of 60° by 2 to get 30°



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PRIMARY LEAVING EXAMINATION (P.L.E)
DECEMBER – 2017

SUBJECT: MATHEMATICS

TIME: $2\frac{1}{2}$ Hours

Answer all questions

Question One.

A) Complete the table below

Roman Numerals	Roman numbers
1	I
4	IV
5	V
9	IX

B) Workout the following;

i) $642437 + 235241$

$$\begin{array}{r} 642437 \\ + 235241 \\ \hline 877678 \end{array}$$

ii) $4.03 + 3.4$

$$\begin{array}{r} 4.03 \\ + 3.4 \\ \hline 7.43 \end{array}$$

iii) 340×56

$$\begin{array}{r} 340 \\ \times 56 \\ \hline 2040 \\ + 1700 \\ \hline 19040 \end{array}$$

C) Add: $348 + 456 + 295$

$$\begin{array}{r} 348 \\ 456 \\ + 295 \\ \hline 1099 \end{array}$$

D) Convert the following fractions into decimals.

i) $\frac{7}{10}$

$$= \frac{70}{100} = \frac{70}{100}$$

$$= 0.7$$

$$\begin{aligned} \text{ii)} \quad & \frac{1}{100} \\ &= \frac{0.01}{100} \end{aligned}$$

$$= \underline{\underline{0.01}}$$

$$\begin{aligned} \text{iii)} \quad & \frac{18}{100} \\ &= \frac{0.18}{100} \end{aligned}$$

$$= \underline{\underline{0.18}}$$

E) Workout the following using LCM:

$$\begin{aligned} \text{i)} \quad & 3\frac{1}{2} \times 2\frac{1}{4} \\ &= (3 + 2) + \frac{1}{2} + \frac{1}{4} \\ &= 5 + \frac{2 + 1}{4} \\ &= 5\frac{3}{4} \end{aligned}$$

$$\begin{aligned} \text{ii)} \quad & \frac{1}{4} \times \frac{1}{8} \\ &= \frac{2 + 1}{8} \\ &= \frac{3}{8} \end{aligned}$$

$$\begin{aligned} \text{iii)} \quad & 4\frac{3}{5} + 3\frac{2}{15} + 2 \\ &= (4 + 3 + 2) + \frac{3}{5} + \frac{2}{15} \end{aligned}$$

$$\begin{aligned} &= (9) + \frac{9 + 2}{15} \\ &= 9\frac{11}{15} \end{aligned}$$

F) Change the following into improper fractions.

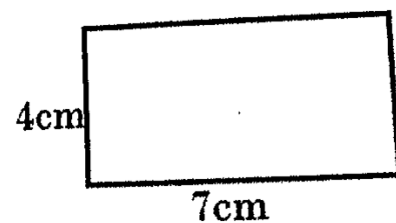
$$\begin{aligned} \text{i)} \quad & 7\frac{1}{2} \\ &= \frac{4 \times 7 + 1}{2} \\ &= \frac{29}{2} \end{aligned}$$

$$\begin{aligned} \text{ii)} \quad & 8\frac{5}{12} \\ &= \frac{12 \times 8 + 5}{12} \\ &= \frac{101}{12} \end{aligned}$$

$$\begin{aligned} \text{iii)} \quad & 11\frac{2}{12} \\ &= \frac{3 \times 11 + 2}{3} \\ &= \frac{35}{3} \end{aligned}$$

Question Two.

A) Find the area of the rectangle below.

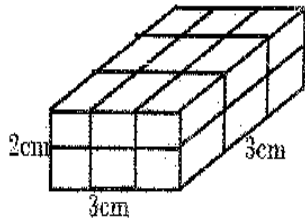


$$\text{Area} = L \times W$$

$$\text{Area} = 7\text{cm} \times 4\text{cm}$$

$$\underline{\underline{\text{Area} =}}$$

B) Find the volume of the stack below.



$$\text{Volume} = L \times W \times H$$

$$\text{Volume} = 3\text{cm} \times 2\text{cm} \times 3\text{cm}$$

$$\underline{\underline{\text{Volume} =}}$$

C) Change the following litres into millilitres.

i) 3litres

$$1\text{litre} = 100\text{ml}$$

$$3\text{litres} = \frac{3\text{litres} \times 100\text{ml}}{1\text{litre}}$$

$$= \frac{3 \times 100\text{ml}}{1}$$

$$= \underline{\underline{300\text{ml}}}$$

ii) 6litres

$$1\text{litre} = 100\text{ml}$$

$$6\text{litres} = \frac{6\text{litres} \times 100\text{ml}}{1\text{litre}}$$

$$= \frac{6 \times 100\text{ml}}{1}$$

$$= \underline{\underline{600\text{ml}}}$$

Question Three.

A) Andrew bought a shirt at 25ssp and later sold it to his friend Deng at 40ssp. Find his percentage profit.

Profit (P) = selling price (SP) – buying Price (BP)

$$P = \text{SSP}40 - \text{SSP}25$$

$$P = \text{SSP}15$$

$$\% \text{Profit} = \frac{\text{profit}}{\text{buying price}} \times 100\%$$

$$= \frac{\text{SSP}15}{\text{SSP}25} \times 100\%$$

$$= 15 \times 4$$

$$= \underline{\underline{60\%}}$$

B) Solve the simultaneous equation below.

$$3x + 3y = 27$$

$$2x + 3y = 24$$

$$3x + 3y = 27$$

$$2x + 3y = 24$$

$$\underline{\underline{X + 0 = 3}}$$

$$\underline{\underline{X = 3}}$$

From equation $3x + 3y = 27$

$$= (3 \times 3) + 3y = 27$$

$$= 9 + 3y = 27$$

$$= 3y = 27 - 9$$

$$= \frac{3y}{3} = \frac{18}{3}$$

$$Y = 6$$

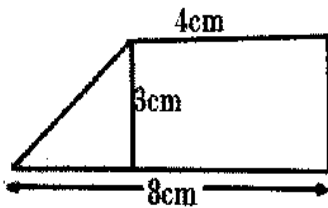
Therefore x=3 and y=6

C) If $w=3$, $x = 2$, and $y = 0$. Find the value of;

$$\begin{aligned}
 \text{i)} \quad & \frac{w^2 + x^2}{13} \\
 &= \frac{3^2 + 2^2}{13} \\
 &= \frac{(3 \times 3 + 2 \times 2)}{13} \\
 &= \frac{9+4}{13} = \frac{13}{13} \\
 &= \underline{\underline{1}}
 \end{aligned}$$

$$\begin{aligned}
 \text{ii)} \quad & 3w - 2y + x \\
 & 3w - 2y + x \\
 & 3 \times 3 - 2 \times 0 + 2 \\
 & 9 - 0 + 2 \\
 & = \underline{\underline{11}}
 \end{aligned}$$

D) What is the area of the trapezium below?



$$\begin{aligned}
 \text{Area} &= \frac{1}{2} \times h \times (a + b) \\
 &= \frac{1}{2} \times 3 \text{ cm} \times (4 \text{ cm} + 8 \text{ cm}) \\
 &= \frac{1}{2} \times 3 \text{ cm} \times 12 \text{ cm} \\
 &= 1 \times 3 \times 6 \\
 &= 18 \text{ cm}^2
 \end{aligned}$$

Question Four.

A) Give a condition for divisible by 3.

A whole number is divisible by three if the total sum of the number is divisible by 3.

B) Is 484 divisible by 4?

$$\begin{array}{r}
 121 \\
 4 \overline{) 484} \\
 \underline{4} \\
 84 \\
 \underline{8} \\
 4
 \end{array}$$

$$484 = 121$$

484 is divisible by 4

C) State if the statements below are true or false.

1. 3716 is divisible by 4. **(True)**
2. 894 is divisible by 4. **(False)**
3. 1052 is divisible by 2. **(True)**
4. 96 is divisible by 3. **(True)**
5. 582 is divisible by 5. **(False)**

D) Define the divisor.

Is any number which can divide a given number without a remainder.

E) Write the divisor of the following numbers.

1. 27: = {1, 3, 9, 27}
2. 65: = {1, 5, 13, 65}
3. 21: = {1, 3, 7, 21}
4. 18: = {1, 2, 3, 6, 9, 18}

F) Find the G.C.D of 12 and 36.

$$\text{D of 12} = 1, 2, 3, 4, 6, 12$$

$$\text{D of 36} = 1, 2, 3, 6, 8, 12, 18, 36$$

$$\text{G.C.D of 12 and 36} = \underline{\underline{12}}$$

Question Five.

- a) Use the information given on the table below to answer the questions that follow.

Day of week	Mon	Tue	Wed	Thu	Fri
Attendance	40	32	38	40	30

- i) On which day of the week was the attendance highest?

Monday and Tuesday

- ii) On which day was the attendance lowest?

Friday = 30

Friday is the lowest.

- iii) Calculate the mean attendance for the week.

$$\text{Mean} = \frac{\text{total amount}}{\text{number of items}}$$

$$\text{Mean} = \frac{40+32+38+40+30}{5}$$

$$\text{Mean} = \frac{180}{5}$$

$$= \underline{\underline{36}}$$

- iv) What would be the median?

40, 32, 38, 40, 30

Re-arrange

30, 32, 38, 40, 40

$$= \underline{\underline{38}}$$

- b) Set A is a set of alphabets A, B, C, D, and E, set B is a set of vowels letters in alphabet.

- i) Name the two sets.

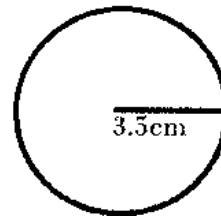
Set A = {A, B, C, D, E}

Set B = {a, e, i, o, u}

- ii) find $A \cap B$

$A \cap B = \{A, E\}$

- c) Find the circumference of the figure below (take $\pi = 3.14$)



$$C = 2\pi r$$

$$= 2 \times 3.14 \times 3.5 \text{ cm}$$

$$C = \underline{\underline{21.980 \text{ cm}}}$$

Question six.

- A) Moses borrowed SSP 60,000 from the bank at the rate of What amount of money would he pay as interest at the end of 6 years?

$$\text{Interest} = P \times T \times \frac{R}{100}$$

$$= 60,000 \times 6 \times \frac{2\frac{1}{2}}{100}$$

$$= 60,000 \times 6 \times \frac{5}{2} \div 100$$

$$= \frac{60,000 \times 3 \times 5}{100} = \frac{900,000}{100}$$

$$\underline{\underline{\text{Interest} = 9,000 \text{ SSP}}}$$

- B) A salesman is paid 5% commission on the sales he makes. One day he made a sale of SSP 9,600. How much commission was he paid?

Commission = 5% of SSP9,600

$$\text{Commission} = \frac{5}{100} \times \text{SSP}9,600$$
$$= 5 \times 96$$

Commission = SSP480

- C) Mary bought a radio on hire purchase. She paid a deposit of SSP 200 and the balance in 12 equal monthly instalments of SSP 50 each. What was the hire purchase price?

A deposit = SSP 200

Monthly instalment = (12x50) = 600

H.P = deposit + monthly instalment

$$= 200 + 600$$

= SSP 800

THE END

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Answer all questions

SECTION “A” (40MARKS)

Question One

- a) Workout $5731 + 2903$

$$\begin{array}{r} 5731 \\ + 2903 \\ \hline 8634 \end{array}$$

- b) What is the place value of digit 5 in the number: 835007?

The place value of 5 is thousand.

- c) Write down the number 3620 in words.

Three thousand six hundred and twenty.

- d) Simplify $10 - (-4)$

$$10 - (-4) = 10 + 4 = 12$$

Answer is 14.

- e) List all the prime numbers between 4 and 16.

The prime number between 4 and 16 = {5, 7, 11, 13}

Question Two

- a) What is the square root of $\frac{9}{16}$

$$\begin{aligned} \sqrt{\frac{9}{16}} &= \frac{3 \times 3}{4 \times 4} \\ &= \frac{3}{4} \end{aligned}$$

- b) Find the 30% decrease of 90 cows belong to Tombe.

Original no. of cows 90 = 100%

%age decrease = $100\% - 30\% = 70\%$

$$70\% = \frac{70}{100} \times 90$$

= 63 cows

- c) $A = \{3, 6, 9, 12, 15\}$ and $B = \{4, 5, 6, 9, 11\}$ are two sets. Find the intersection (AnB)

$A = \{3, 6, 9, 12, 15\}$

$B = \{4, 5, 6, 9, 11\}$

(AnB) = {6 and 9}

- d) The floor of the room measures 8 meter by 6 meter. Find its area.

$$\text{Area} = L \times W$$

$$\text{Area} = 8\text{m} \times 6\text{m}$$

$$\text{Area} = \underline{48\text{m}^2}$$

- e) Share 40 tins of honey between two boys in the ratio 1:4.

$$\text{Total ratio} = 1 + 4 = 5$$

First boy

$$= \frac{1}{5} \times 40\text{tins}$$

$$= 8\text{tins}$$

Second boy

$$= \frac{4}{5} \times 40\text{tins}$$

$$= 32\text{tins}$$

Question Three

- a) Workout $2p + q + 3r$ given that $p=4$, $q=3$ and $r=2$.

$$= 2p + q + 3r$$

$$= 2 \times p + q + 3 \times r$$

$$= 2 \times 4 + 3 + 3 \times 2$$

$$= 8 + 3 + 6$$

$$\underline{=17}$$

- b) Solve: $4x = x + 12$

$$4x = x + 12$$

$$4x - x = 12 \text{ (collect like terms)}$$

$$3x = 12$$

$$\frac{3x}{3} = \frac{12}{3}$$

$$\underline{X = 4}$$

- c) Simplify $(\frac{1}{4} \times \frac{1}{2}) + (1\frac{1}{4} \times \frac{2}{5})$

$$(\frac{1}{4}) \times (\frac{1}{2}) + (1\frac{1}{4} \times \frac{2}{5})$$

$$= (\frac{1}{8}) + (\frac{5}{4} \times \frac{2}{5})$$

$$= \frac{1}{8} + \frac{1}{2} = \frac{1+4}{8} = \frac{5}{8}$$

- d) Workout: $13.48 - 14.67 + 6.12$

$$13.48 - 14.67 + 6.12$$

Add the positive one first

$$13.48$$

$$+ 6.12$$

$$\underline{19.60}$$

Subtract:

$$19.60$$

$$- 14.67$$

$$\underline{4.93}$$

- e) Convert 12:5 hours to minutes

$$1 \text{ hour} = 60 \text{ minutes}$$

$$12 \text{ hours} = \frac{12 \text{ hours} \times 60 \text{ minutes}}{1 \text{ hour}}$$

$$= 12 \times 60 \text{ minutes} + 5\text{minutes}$$

$$= 720 \text{ minutes} + 5 \text{ minutes}$$

$$\underline{=725 \text{ minutes}}$$

Question Four

- a) Convert 36000 meters to kilometers.

$$1000\text{m} = 1\text{km}$$

$$36000\text{m} = \frac{36000\text{m} \times 1\text{km}}{1000\text{m}}$$

$$= 36 \times 1\text{km}$$

$$= \underline{\underline{36\text{km}}}$$

- b) Find the volume of the box of length 12cm, width 6cm and height 2cm.

$$\text{Volume} = L \times W \times H$$

$$= 12\text{cm} \times 6\text{cm} \times 2\text{cm}$$

$$= \underline{\underline{144\text{cm}^3}}$$

- c) Find the circumference of the circle whose diameter is 21cm. (given $\pi = \frac{22}{7}$)

$$\text{Circumference} = \pi d$$

$$\text{Circumference} = \frac{22}{7} \times 21\text{cm}$$

$$\text{Circumference} = 22 \times 3\text{cm}$$

$$\text{Circumference} = \underline{\underline{66\text{cm}}}$$

- d) Wani travelled at speed of 20km/hr for $3\frac{1}{4}$ hours. Find the distance that he covered.

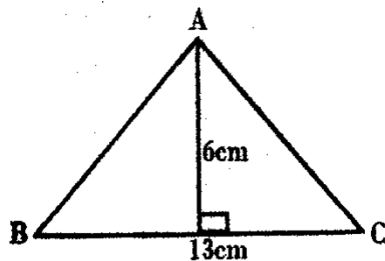
$$\text{Distance} = \text{speed} \times \text{time}$$

$$= 20\text{km/hr} \times 3\frac{1}{4} \text{ hours}$$

$$= 20\text{km/hr} \times \frac{13}{4} \text{ hours}$$

$$\text{Distance} = \underline{\underline{65\text{km}}}$$

- e) Find the area of the triangle ABC show in figure below.



$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$\text{Area} = \frac{1}{2} \times 13\text{cm} \times 6\text{cm}$$

$$\text{Area} = \underline{\underline{39\text{cm}^2}}$$

SECTION "B" (60MARKS)

Question Five

- a) List all the factors of 8.

$$\text{Factors of } 8 = \underline{\underline{\{1, 2, 4, 8\}}}$$

- b) Express 90% as decimal.

$$90\% = \frac{90}{100} = \frac{9}{10}$$

$$= \begin{array}{r} 0.9 \\ 10 \overline{) 90} \\ \underline{90} \\ 00 \end{array}$$

$$\underline{\underline{90\% = 0.9}}$$

- c) Solve the simultaneous equation

$$3x + y = 16 \dots\dots\dots (1)$$

$$2x + y = 12 \dots\dots\dots (2)$$

Use same signs subtract (SSS) and different signs add (DSA)

$$3x + y = 16 \dots\dots\dots (1)$$

$$2x + y = 12 \dots\dots\dots (2)$$

$$\underline{\hspace{1cm}} \\ X + 0 = 4$$

$$X = 4$$

From eqn. (1)

$$3x + y = 16 \dots\dots\dots (1)$$

$$(3 \times 4) + y = 16$$

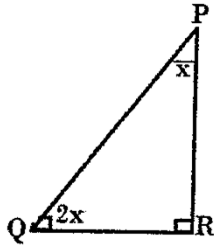
$$12 + y = 16$$

$$Y = 16 - 12$$

$$Y = 4$$

Therefore $x=4$ and $y=4$

- d) Find the size of the following angles indicated in triangle shown below.



- (i) Angle x
(ii) Angle $2x$

First find x

$$x + 2x = 90$$

$$\frac{3x}{3} = \frac{90}{3}$$

$$x = 30$$

- (i) Angle $x = \underline{30}$
(ii) Angle $2x = 2 \times 30 = \underline{60}$

Question Six.

- a) Convert 0.125 tons into kilograms

$$1\text{ton} = 1000\text{kg}$$

$$0.125\text{tons} \times 1000\text{kg}$$

$$0.125\text{tons} = \frac{0.125\text{tons} \times 1000\text{kg}}{1\text{ton}}$$

$$\underline{0.125\text{tons} = 125\text{kg}}$$

- b) The price of a T-shirt is SSP80. Find the buying price if the discount of 10% is allowed.

Market price = SSP80

%age discount = 10%

Discount = 10% of SSP80

$$\text{Discount} = \frac{10}{100} \times \text{SSP80}$$

Discount = SSP8

Buying price = M.P – Discount

Buying price = SSP80 – SSP 8

Buying price = SSP72

- c) A teacher gave an English test to pupils and they obtained the following scores 70, 45, 70, 55, 50.

Find:

- (i) Mean score

$$\text{Mean} = \frac{\text{total amount}}{\text{no of items}}$$

$$\text{Mean} = \frac{70 + 45 + 70 + 55 + 50}{5}$$

$$\text{Mean} = \frac{290}{5}$$

$$\text{Mean} = \underline{58}$$

- (ii) Modal score

Re-arrange the numbers

Mode = 45, 50, 55, 70, 70

Mode = 70

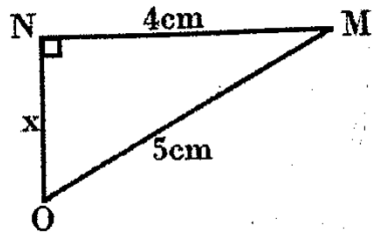
- (iii) Median score

Re-arrange the numbers

Median = 45, 50, 55, 70, 70

Median = 55

- d) Find the length X of the side of the triangle MNO in the figure below.



Using $NO^2 + NM^2 = MO^2$

$$X^2 + 16\text{cm} = 25\text{cm}$$

$$X^2 = 25\text{cm} - 16\text{cm}$$

$$\sqrt{x^2} = \sqrt{9\text{cm}}$$

$$\underline{\underline{X = 3\text{cm}}}$$

Question Seven.

- a) Express 0.05 as fraction in its lowest form.

$$0.05 = \frac{5}{100}$$

$$0.05 = \frac{1}{20}$$

- b) 60% of pupils in a school are boys and 40% are girls. Find the ratio of girls to boys in the simplest form.

%age of boys = 60%

%age of girls = 40%

Boys:girls = 60%:40%

Boys:girls = 6:4

Boys:girls = 3:2

- c) 5 mangoes weigh 400g, find the weight of 20 similar mangoes.

5 mangoes = 400g

$$1 \text{ mango} = \frac{400\text{g}}{5}$$

$$20 \text{ mangoes} = \frac{400\text{g}}{5} \times 20$$

$$= \frac{400\text{g}}{1} \times 4$$

20mangoes = 1600g

- d) A box contains 6 red balls and 4 green balls mixed together. Morbe draws one ball at random from the box. What is the probability that he will draws a green ball?

$$\text{Probability} = \frac{\text{expected outcome}}{\text{sample space}}$$

$$\text{Probability} = \frac{\text{green}}{\text{red} + \text{green}}$$

$$\text{Probability} = \frac{4}{6+4}$$

$$\text{Probability} = \frac{4}{10}$$

$$\text{Probability} = \frac{2}{5}$$

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MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY
PRIMARY LEAVING EXAMINATION (P.L.E)
DECEMBER – 2014

SUBJECT: MATHEMATICS

TIME: $2\frac{1}{2}$ Hours

Answer all questions

SECTION “A”

1. Workout $107256 + 2015$

$$\begin{array}{r} 107256 \\ + 2015 \\ \hline 109271 \end{array}$$

2. What is the place value of 4 in 84616?

The place value of 4 in 84616 is thousands.

3. Write 93031 in words

Ninety three thousand and thirty one.

4. Find the square root of $\sqrt{9} \div 16$

$$\sqrt{9} \div 16$$

$$= 3 \div 16$$

$$= \frac{3}{16} \text{ Or } 0.1875$$

5. Write the multiples of 2 between 5 and 9

M2 between 5 and 9

$$= \{6 \text{ and } 8\}$$

6. Simplify $-15 + -12$

$$-15 + -12$$

$$= -15-12$$

$$= \underline{\underline{-27}}$$

7. Change $\frac{3}{4}$ into decimal

$$\frac{3}{4} = \begin{array}{r} 0.75 \\ 4 \overline{) 30} \\ \underline{28} \\ 20 \\ \underline{20} \\ 00 \end{array}$$

$$\frac{3}{4} = \underline{\underline{0.75}}$$

8. Express $\frac{3}{20}$ as a percentage?

$$\frac{3}{20} = \frac{3}{20} \times 100\%$$

$$= \underline{\underline{15\%}}$$

9. Use $=, <, >$ to make the following statements true.

$$9 + 14 \dots\dots\dots 23 \times 2$$

$$\underline{\underline{9 + 14 < 23 \times 2}}$$

10. Write $3\frac{1}{4}$ as an improper fraction

$$3\frac{1}{4} = \frac{4 \times 3 + 1}{4}$$

$$= \frac{13}{4}$$

11. Change 500m to km

$$1000\text{m} = 1\text{km}$$

$$500\text{m} = \frac{500\text{m} \times 1\text{km}}{1000\text{m}}$$

$$500\text{m} = \frac{1}{2}\text{km} \text{ Or } \underline{0.5\text{km}}$$

12. Multiply $5\frac{1}{3} \times \frac{1}{6}$

$$5\frac{1}{3} \times \frac{1}{6} = \frac{17}{3} \times \frac{1}{6}$$

$$= \frac{17}{18}$$

13. Work out $81 \div 9 \times 2 - 4$

Use BODMAS

$$81 \div 9 \times 2 - 4$$

$$= 9 \times 2 - 4$$

$$= 18 - 4$$

$$= \underline{14}$$

14. Find the prime factors of 42

$$\begin{array}{r|l} 2 & 42 \\ 3 & 21 \\ 7 & 7 \\ & 1 \end{array}$$

Prime factors of 42

$$= \underline{2 \times 3 \times 7}$$

15. Subtract $18.01 - 3.20$

$$\begin{array}{r} 18.01 \\ - 3.20 \\ \hline 14.81 \end{array}$$

16. Two bags of groundnuts weight 80kgs, find the weight of 5bags of similar kind.

$$2\text{bags} = 80\text{kg}$$

$$1\text{bag} = \frac{80\text{kg}}{2}$$

$$5\text{bags} = \frac{80\text{kg}}{2} \times 5$$

$$= \underline{200\text{kg}}$$

17. Given that $p=4$, $q=3$ and $r=2$. Find $\frac{pq}{r}$

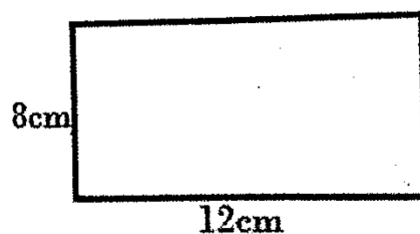
$$\frac{pq}{r} = \frac{p \times q}{r}$$

$$= \frac{4 \times 3}{2}$$

$$= \frac{12}{2}$$

$$= \underline{6}$$

18. Find the perimeter of the figure below.



$$P = 2(L+W)$$

$$P = 2(12\text{cm} + 8\text{cm})$$

$$P = 2(20\text{cm})$$

$$= \underline{40\text{cm}}$$

19. A rectangular box measures 4cm by 3cm by 2cm. Find its volume in cm^3 .

$$\text{Volume} = L \times W \times H$$

$$\text{Volume} = 4\text{cm} \times 3\text{cm} \times 2\text{cm}$$

$$\underline{\underline{\text{Volume} = 24\text{cm}^3}}$$

20. John rolled a dice containing 6 faces, what is the probability that an even number will show up?

Sample space of a dice

$$= \{1, 2, 3, 4, 5, 6\}$$

Even numbers

$$= \{2, 4, 6\}$$

$$\text{Probability} = \frac{\text{even number}}{\text{sample space}}$$

$$= \frac{3}{6} = \frac{1}{2}$$

21. Decrease 120m by 20%

$$\text{Original \%age} = 100\%$$

$$\text{\%age decrease} = 20\%$$

$$\text{New \%age} = 100\% - 20\% = 80\%$$

$$80\% = \frac{80}{100} \times 120\text{m}$$

$$= \underline{\underline{96\text{m}}}$$

22. Using the numbers 4, 7, 5, 1, 6, 7, 8,
2. Find the mean.

$$\text{Mean} = \frac{\text{total amount}}{\text{number of items}}$$

$$= \frac{4+7+5+1+6+7+8+2}{8} = \frac{40}{8}$$

$$\underline{\underline{\text{Mean} = 5}}$$

23. Solve the equal, $2x - 1 = 3$.

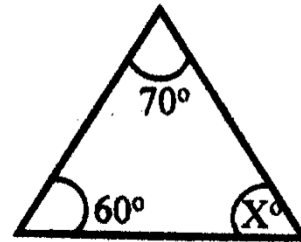
$$2x - 1 = 3$$

$$2x - 1 + 1 = 3 + 1$$

$$\frac{2x}{2} = \frac{4}{2}$$

$$\underline{\underline{X = 2}}$$

24. In the following figure, calculate the value of x.



$$X + 60^\circ + 70^\circ = 180^\circ$$

$$X + 130^\circ - 130^\circ = 180^\circ - 130^\circ$$

$$\underline{\underline{X = 50^\circ}}$$

25. An examination started at 8:30am and ended at 10:45am. How long was the examination?

$$\text{Ending time} = 10:45 \text{ am}$$

$$\text{Starting time} = 8:45 \text{ am}$$

$$10:45 \text{ am}$$

$$- 8:20 \text{ am}$$

$$\underline{\underline{2:15\text{hrs}}}$$

SECTION "B" (60MARKS)

26. Find the value of

$$\frac{a^2 + c}{b} \text{ given that } a = 4, b = 2, c = 6.$$

$$\frac{a^2 + c}{b} = \frac{4^2 + 6}{2}$$

$$= \frac{16 + 6}{2}$$

$$= \frac{22}{2} = \underline{\underline{11}}$$

27. Mary and Sarah shared 24 oranges in the ratio 1:2.

- i. How many oranges did Mary get?

$$\text{Total shared} = 1 + 2 = 3$$

$$\text{Mary} = \frac{1}{3} \times 24 \text{ oranges}$$

Mary got 8 oranges

- ii. How many oranges did Sarah get?

$$\text{Total shared} = 1 + 2 = 3$$

$$\text{Sarah} = \frac{2}{3} \times 24 \text{ oranges}$$

Sarah got 16 oranges

28. A cyclist travelled at speed of 80km/hr. if he covers the distance of 160km. calculate the time taken for the whole journey.

$$\text{Time} = \frac{\text{distance}}{\text{speed}}$$

$$\text{Time} = \frac{160\text{km}}{80\text{km/hr}}$$

$$\text{Time} = \underline{\underline{2\text{hours}}}$$

29. Find the circumference of a circle whose diameter is 35cm. (take π as $\frac{22}{7}$)

$$\text{Circumference} = \pi d$$

$$= \frac{22}{7} \times 35\text{cm}$$

$$\text{Circumference} = \underline{\underline{110\text{cm}}}$$

30. Solve the following simultaneous equation.

$$X + y = 6$$

$$X - y = 4$$

Use SSS and DSA

$$X + y = 6$$

$$X - y = 4$$

$$2x = 10$$

$$\frac{2x}{2} = \frac{10}{2}$$

$$X = 5$$

From equation $x + y = 6$

$$5 + y = 6$$

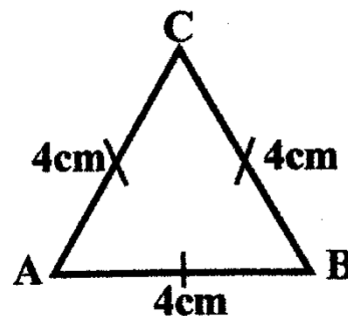
$$Y = 6 - 5$$

$$Y = 1$$

$$\underline{\underline{X = 5 \text{ and } y = 1}}$$

31. (a) using a pair of compasses and a ruler only, construct an equilateral triangle ABC with sides 4cm.

An equilateral triangle has all the three angles measuring 60°



- (b) Simplify $3(2x + 4y) - (3x - 2y)$

$$3(2x + 4y) - (3x - 2y)$$

$$= 6x + 12y - 3x - 2y$$

$$= 6x - 3x + 12y - 2y$$

$$\underline{\underline{= 3x + 10y}}$$

32. John bought a bag of sugar for SSP120. He sold it making a profit of 10%,

a) Find the selling prices.

Buying price = SSP120

100% profit = 10%

Selling price = buying price + profit

= 100% + 10% = 110%

= 110% = $\frac{110}{100} \times 120\text{SSP}$

Selling price = 132SSP

Or

10% of 120 = $\frac{10}{100} \times 120\text{SSP}$

Profit = 12SSP

Selling price = Buying price + profit

Selling price = 120SSP + 12SSP

Selling price = 132SSP

b) Find the profit in SSP.

Profit = 10% of 120 =

$\frac{10}{100} \times 120\text{SSP}$

Profit = 12SSP

33. A ball into bucket full of water, 30% of water spilt down.

a) What percentage of water was left in the bucket?

Original %age = 100%

%age of water spilt = 30%

%age left = (100% - 30%)

%age left = 70%

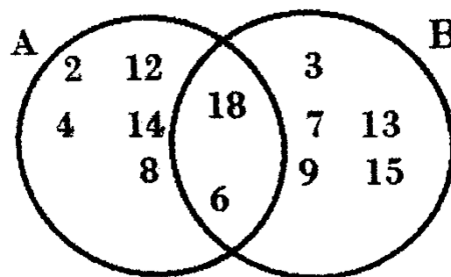
b) What fraction of water got spilt?

$$30\% = \frac{30}{100}$$

$$30\% = \frac{3}{10}$$

The fraction of water that spilt = $\frac{3}{10}$

34. Given the following sets A and B. list the members of;



(i) Set (A) =

(ii) Set (A n B) =

(iii) Set (B) only

(i) Set A={2,4,6,8,12,14,18}

(ii) Set (AnB)={6 and 18}

(iii) Set (B) only = {3,7,9,13,15}

35. A farmer gets 36 litres of milk each day. How many litres of milk did he get in the month of December 2013?

1 day = 36litres

3days = $\frac{31\text{days} \times 36\text{litres}}{1\text{day}}$

3days = 1115litres

36. Six pupils attended mathematics test and the following were their scores 7, 5, 4, 7, 7, 5.

a) The modal score

$$\text{Modal} = 7, 5, 4, 7, 7, 5$$

Re-arrange

$$4, 5, 5, 7, 7, 7$$

$$\underline{\text{Modal} = 7}$$

b) Median score

$$\text{Median} = 7, 5, 4, 7, 7, 5$$

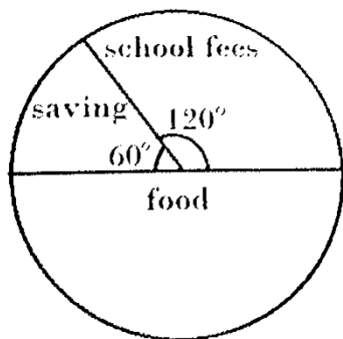
Re-arrange

$$\cancel{4}, \cancel{5}, 5, 7, \cancel{7}, \cancel{7}$$

$$\text{Median} = \frac{5+7}{2} = \frac{12}{2}$$

$$\text{Median} = 6$$

37. The following pie chart represents information on how John spends his income, use the information to answer the following questions.



What fraction represents money spent on

(i) School fees

$$\text{School fees} = \frac{120}{360}$$

$$\text{School fees} = \frac{1}{3}$$

(ii) Food

Let the angle representing food be x

$$X + 60^{\circ} + 120^{\circ} = 360^{\circ}$$

$$X + 180^{\circ} - 180^{\circ} = 360^{\circ} - 180^{\circ}$$

$$X = 180^{\circ}$$

$$\text{Food} = \frac{180}{360}$$

$$\text{Food} = \frac{1}{2}$$

(iii) Saving

$$\text{saving} = \frac{60}{360}$$

$$\text{saving} = \frac{1}{6}$$

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Answer all questions

SECTION 'A'

1. what is the place value of 7 in 56753?

The place value of 7 is hundreds.

2. Divide 560 by 8

$$\underline{560 \div 8 = 70}$$

3. Add: $1.43 + 12.57$

$$\begin{array}{r} 1.43 \\ + 12.57 \\ \hline 14.00 \end{array}$$

4. Given that $A = \{1, 5, 7, 8, 9\}$ and $B = \{3, 2, 5, 9, 4\}$. Find set $A \cap B$.

$$A = \{1, 5, 7, 8, 9\}$$

$$B = \{3, 2, 5, 9, 4\}$$

$$\underline{A \cap B = \{5 \text{ and } 9\}}$$

5. Find the area of a circle whose radius is 7cm. use $(\pi \frac{22}{7})$

$$\text{Area} = \pi r^2$$

$$\text{Area} = \frac{22}{7} \times 7\text{cm} \times 7\text{cm}$$

$$\underline{\text{Area} = 154\text{cm}^2}$$

6. A school was given 2153 exercise books to give to pupils. If 2095 exercise were given out. How many exercise books were left in the school store?

$$\begin{array}{r} 2153 \\ - 2095 \\ \hline 0058 \end{array}$$

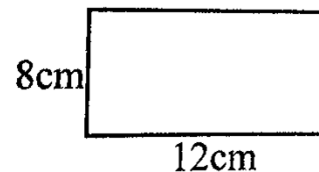
7. Round off 37456 to the nearest thousands.

$$37456 = \underline{37000}$$

8. Add: weeks days

$$\begin{array}{r} 04 \quad 11 \\ + 05 \quad 09 \\ \hline 00 \quad 58 \end{array}$$

9. Find the perimeter of the figure below.



$$\text{Perimeter} = 2(L+W)$$

$$\text{Perimeter} = 2(12\text{cm} + 8\text{cm})$$

$$\text{Perimeter} = 2(20\text{cm})$$

$$\underline{\underline{\text{Perimeter} = 40\text{cm}}}$$

10. Find the value of the following

a) $11.8 + 7.12 - 8.31$

$$\begin{array}{r} 11.8 \\ + 7.12 \\ \hline 18.92 \end{array}$$

Subtract 8.31 from 18.92

$$\begin{array}{r} 18.92 \\ - 8.31 \\ \hline 10.61 \end{array}$$

b) $8 - 2.53$

$$\begin{array}{r} 8.00 \\ - 2.53 \\ \hline 5.47 \end{array}$$

11. In a box of soda, which contain 24 bottles

$\frac{1}{3}$ are Fanta and the rest are Coca-Cola, find the number of Coca-Cola bottles?

$$\text{No. of bottles} = 24$$

$$\text{No. of Fanta} = \frac{1}{3}$$

$$= \frac{1}{3} \times 24 \text{ bottles}$$

$$= 8 \text{ bottles}$$

$$\text{No. of Coca-Cola} = \text{no. of bottles} - \text{no. of Fanta}$$

$$= 24 \text{ bottles} - 8 \text{ bottles}$$

$$= \underline{\underline{16 \text{ bottles of Coca-Cola}}}$$

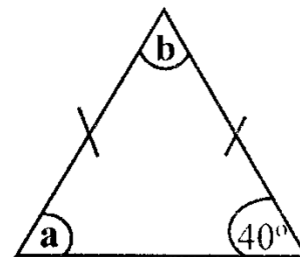
12. Find the prime factor of 45?

$$\begin{array}{r|l} 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

Prime factors of 45

$$= \underline{\underline{3 \times 3 \times 5}}$$

13. In the figure below, find the value of angles marked with letters.



$$\text{Angle } a = 40^\circ$$

Angle b

$$b + 40^\circ + 40^\circ = 180^\circ$$

$$b + 80^\circ - 80^\circ = 180^\circ - 80^\circ$$

$$\underline{\underline{b = 100^\circ}}$$

14. Jada had 6 green balls, 3 red balls and 5 yellow balls in a basket. If a ball picked randomly without looking at the basket, what is the probability of picking green balls.

$$\text{Probability} = \frac{\text{expected outcome}}{\text{sample space}}$$

$$\text{Probability} = \frac{\text{green}}{\text{green} + \text{red} + \text{yellow}}$$

$$\text{Probability} = \frac{6}{6+3+5}$$

$$\text{Probability} = \frac{6}{14}$$

$$\text{Probability} = \frac{3}{7}$$

15. Change the following decimal into fraction in its lowest form 0.25.

$$0.25 \times 100 = 25$$

$$0.25 = \frac{25}{100}$$

$$0.25 = \frac{1}{4}$$

16. Primary 8 pupils score the following marks in Math test: 60, 30, 85, 50, 40, 80, 70. What is its median marks?

60, 30, 85, 50, 40, 80, 70

Re-arrange the numbers

30, 40, 50, 60, 70, 80, 85

Median = 60

17. List down all the multiples of 4 between 3 and 17.

M of 4 = {4, 8, 12, 16}

= {4, 8, 12, 16}

18. Poni bought a bag of dura at 80SSP. She sold it making a profit of 15%. Calculate her selling.

Buying price (B.P) 100% = 80SSP

The profit (P) = 15%

Selling price (SP) = B.P + P

S.P = 100% + 15%

= 115%

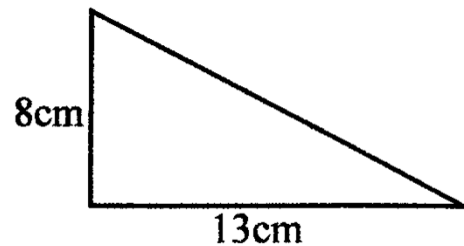
115% of 80SSP = $\frac{115}{100} \times 80SSP$

SP = 92SSP

19. Find the value of the following, given that $x=4$, $y=1$ and $w=5$. $\frac{4x - y^2}{w}$.

$$\begin{aligned} \frac{4x - y^2}{w} &= \frac{4 \times 4 - 1 \times 1}{5} \\ &= \frac{16 - 1}{5} \\ &= \frac{15}{5} = \underline{\underline{3}} \end{aligned}$$

20. What is the area of the triangle below?



$$\text{Area} = \frac{1}{2} \times b \times h$$

$$\text{Area} = \frac{1}{2} \times 13\text{cm} \times 8\text{cm}$$

$$\text{Area} = 52\text{cm}^2$$

21. Find the square root of $6\frac{1}{4}$.

$$\begin{aligned} \sqrt{6\frac{1}{4}} &= \sqrt{\frac{25}{4}} = \frac{5}{2} \\ &= 2\frac{1}{2} \end{aligned}$$

22. A car travel at a speed of 80km/hr for $4\frac{1}{2}$ hours. What distance did the car cover?

Distance (D) = Speed x Time

$$D = 80\text{km/hr} \times 4\frac{1}{2} \text{ hours}$$

$$D = 80\text{km/hr} \times \frac{9}{2} \text{ hours}$$

$$D = 40\text{km} \times 9$$

$$\underline{\text{Distance} = 360\text{km}}$$

23. Decrease SSP550 by 30%.

$$\text{Original \%age} = 100\% \text{ i.e } 550\text{SSP}$$

$$\text{The decrease} = 30\%$$

$$\text{A new \%age} = 100\% - 30\% = 70\%$$

$$70\% = \frac{70}{100} \times 550\text{SSP}$$

$$\underline{\underline{= 385\text{SSP}}}$$

24. Kenyi deposited SSP20,000 in a bank which paid simple interest at the rate of 10% per annum, how much interest did Kenyi earn at the end of 4 years?

$$\text{Interest} = p \times t \times \frac{r}{100}$$

$$\text{In} = 20,000\text{SSP} \times 4 \times \frac{10}{100}$$

$$\underline{\text{Interest} = 8,000\text{SSP}}$$

25. Workout $2\frac{2}{5} - 5\frac{1}{3}$

$$2\frac{2}{5} - 5\frac{1}{3} = \frac{12}{5} - \frac{16}{3}$$

$$= \frac{36 - 80}{15}$$

$$= \frac{-44}{15}$$

26. An oil cylinder has a radius of 20cm. Find its circumference. (Use $\pi=3.14$)

$$\text{Circumference} = 2\pi r$$

$$= 2 \times 3.14 \times 20\text{cm}$$

$$\underline{\underline{= 125.6\text{cm}}}$$

27. Find the square root of 225 by prime factorization method.

$$225 = 3 \times 75$$

$$= 3 \times 3 \times 25$$

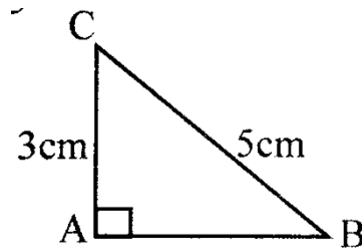
$$= 3 \times 3 \times 5 \times 5$$

$$= (\cancel{3} \times 3) \times (\cancel{5} \times 5)$$

$$= 3 \times 5$$

$$\text{Square root of } 225 = \underline{\underline{15}}$$

28. Find the length between A and B in the figure below.



$$\text{Using } AB^2 + AC^2 = BC^2$$

$$AB^2 + 3\text{cm}^2 = 5\text{cm}^2$$

$$AB^2 + 9\text{cm} = 25\text{cm}$$

$$AB^2 + 9\text{cm} - 9\text{cm} = 25\text{cm} - 9\text{cm}$$

$$AB^2 = 16\text{cm}$$

$$\sqrt{AB^2} = \sqrt{16\text{cm}}$$

$$\underline{\underline{AB = 4\text{cm}}}$$

29. (a) Evaluate:

$$\frac{3.2 \times 4.1}{0.1 \times 2.4} \text{ to correct decimal places:}$$

$$\frac{3.2 \times 4.1}{0.1 \times 2.4} = \frac{3.2 \times 4.1 \times 100}{0.1 \times 2.4 \times 100}$$

$$= \frac{32 \times 41}{1 \times 24} = \frac{1312}{24}$$

$$\underline{\underline{= 54.67}}$$

(b) Simplify $180 - 195 + 35$

$$180 - 195 + 35$$

$$= 180 + 35 - 195$$

$$= \underline{20}$$

30. Juan harvested 245kgs of rice and put them in bags. If each bag contains 50kg, how many bags did Juan pack?

$$50\text{kg} = 1\text{bag}$$

$$2450\text{kg} = \frac{2450\text{kg} \times 1\text{bag}}{50\text{kg}}$$

$$= \underline{49\text{bags}}$$

31. Decrease 42 hours in the ratio of 4:7.

$$4:7 = \frac{4}{7}$$

$$= \frac{4}{7} \times 42 \text{ hours}$$

$$= \underline{24 \text{ hours}}$$

32. Find,

a) $X \text{ in } \frac{1}{2}X - 4 = 3$

$$= 2\frac{1}{2}X - 4 = 3 \times 2$$

$$= x - 4 = 6$$

$$= x - 4 + 4 = 6 + 4$$

$$\underline{X = 10}$$

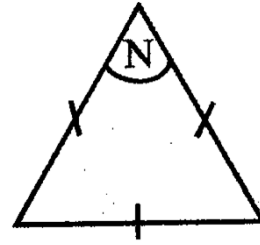
- b) The supplementary angle of 110°

$$\text{The supplementary angle} = 180^\circ$$

$$180^\circ - 110^\circ$$

$$= \underline{70^\circ}$$

33. Find the value of angle marked N in the figure below.



All the sides are the same, and all the angles are the same.

$$N + N + N = 180^\circ$$

$$\frac{3N}{3} = \frac{180^\circ}{3}$$

$$\underline{N = 60^\circ}$$

34. A father is four times older than his son. If the sum of their age is 55 years;

- (i) How old is the son?

Let son's age be x

Father's age be $x + 4x$

$$\text{Son } 5x = 55$$

$$\text{Son } \frac{5x}{5} = \frac{55}{5}$$

$$X = 11$$

$$\underline{\text{Son} = 11 \text{ years}}$$

- (ii) Find the age of the father.

Father's age = total – son's age

$$\text{Father's age} = 55\text{yrs} - 11\text{yrs}$$

$$\underline{\text{Father} = 44\text{years}}$$

35. Solve the following simultaneous equations.

$$3x + 3y = 27 \dots\dots\dots (1)$$

$$3x + 2y = 24 \dots\dots\dots (2)$$

Use same signs subtract (SSS) and different signs Add (DSA)

$$3x + 3y = 27$$

$$3x + 2y = 24$$

$$Y = 3$$

$$Y = 3$$

$$\text{From eqn. } 3x + 3y = 27$$

$$3x + 3(3) = 27$$

$$3x + 9 - 9 = 27 - 9$$

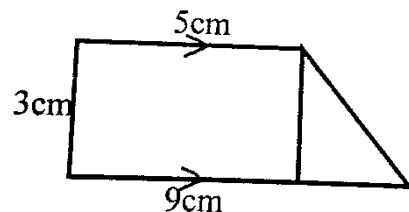
$$3x = 18$$

$$\frac{3x}{3} = \frac{18}{3} = 6$$

$$X = 6$$

Therefore x = 6 and y = 3

36. From the figure below, find its area.



$$\text{Area} = \frac{1}{2} \times h \times (a + b)$$

$$\text{Area} = \frac{1}{2} \times 3cm \times (9cm + 5cm)$$

$$\text{Area} = \frac{1}{2} \times 3cm \times 14cm$$

$$\text{area} = 3cm \times 7cm$$

$$\text{area} = 21cm^2$$

37. 6 workers took 32 days to finish a piece of work. How long will it take 16 workers to do the same job?

$$6 \text{ workers} = 36 \text{ days}$$

$$1 \text{ worker} = 6 \times 36 \text{ days}$$

$$16 \text{ workers} = \frac{6 \times 36}{16}$$

$$= 12 \text{ days}$$

38. A water tank measures 10m by 5m by 2m, find the volume of the tank.

$$\text{Volume} = L \times W \times H$$

$$\text{Volume} = 10m \times 5m \times 2m$$

$$\text{Volume} = 100m^3$$

39. A lady went to market with SSP60 to buy the following items as shown on the table below.

(i) Study and complete the table, show your work clearly.

Items	Quantity	u. price	Total cost
Onion	<u>2kgs</u>	5SSP	10SSP
Oil	1 litre	15SSP	<u>15SSP</u>
Meat	0.5 kgs	30SSP	<u>15SSP</u>

(ii) How much money was left with the lady?

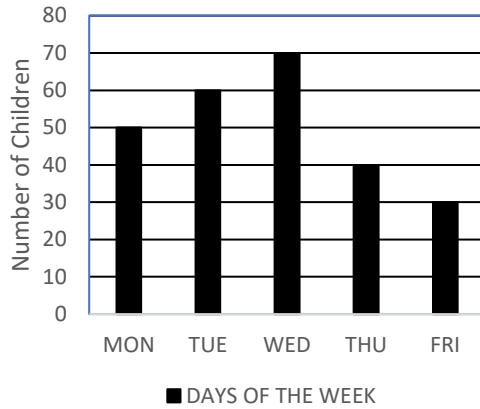
$$\text{Amount left} = \text{Original amount} - \text{Amount spent}$$

$$= 60SSP - 40SSP$$

$$= 20SSP$$

40. The graph below shows the class attendance in primary school for five

consecutive days. Study it and answer the question that follow.



- a) Which day has the highest attendance?

Wednesday

- b) What is the difference in the attendance of Monday and Friday?

Monday = 50

Friday = 30

Difference = Monday – Friday

= 50 – 30

= 20 children

- c) Find the mean attendance for the week.

Mean = $\frac{\text{total amount}}{\text{number of items}}$

Mean = $\frac{30 + 40 + 50 + 60 + 70}{5}$

Mean = $\frac{250}{5}$

Mean = 50