THE DREAM EDUCATION CONCERN

BEGINNING OF TERM III-2024
SPECIAL SET-II

MATHEMATICS

OFFICIAL MARKING GUIDE

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DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

Read the following instructions carefully

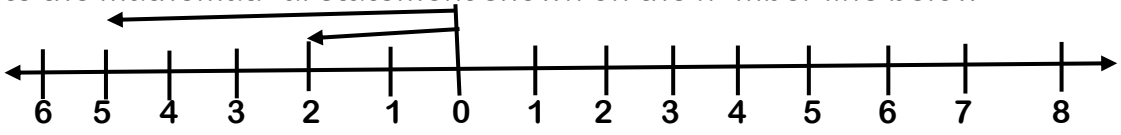
1. This paper is made up of two sections: A and B.
2. Section A has 20 questions (40 marks).
3. Section B has 12 questions (60 marks).
4. Answer ALL questions in both sections A and B.
5. All answers MUST be written in the space provided in blue or black ball point pens or ink. All diagrams Should be in pencil.
6. Unnecessary crossing of answers will lead to loss of Marks.
7. Poor hand writing which cannot be easily read, may lead to loss of marks.

FOR EXAMINERS' USE ONLY		
Qn. No	MARKS	SIGN

SECTION A 2 MARKS EACH (40)

1	Work out 92-19 **Solution process** 92-19 =73 Or 92 -19 73 **Related content**; it is advised that for proper addition, subtraction, and division if a number appears horizontally, must be arranged vertically for proper solving.	2	Write XLVI in Hindu Arabic. **Solution process** XL=40 V=5 I=1 We are to add the above XL = 40 V = 5 + I = 1 =46 Therefore, XLVI will be equal to 46
3	Find the next number in the sequence 11, 15, 21, 29, _____ **Solution process;** -Calculate the difference between the first two numbers (15-11=4) -Calculate the difference between the second and the third number (21-15=6) -Calculate the difference between the third and the fourth number (29-21=8) Note; The difference is increasing by 2, therefore the next difference should be (8+2=10) -Now add 10 to the last number in the sequence which is 29 and the sum will be 39 which is our answer. 11, 15, 21, 29, 39 +4 +6 +8 +10	4	Express 64 using powers of 4 **Solution process** 4 | 64 4 | 16 4 | 4 1 Therefore 64= 4x4x4 $= 4^3$
5	The Dream van uses 4 litres of petrol everyday. how many ¼ litre bottles of petrol does the car use in a day? **Solution process** Determine how many ¼ litre bottles are in 4 litres. since each bottle holds ¼ litre, we can find the number of bottles by dividing the total litres by the volume of each bottle. Number of bottles = $\frac{4 \text{ litres}}{¼ \text{ litres}} = 4$ Thus, the car uses 16¼litres of petrol in one day.	6	Simplify 8-3 (m+5) **Solution process** Advise, apply distributive property. 8-3(m+5) 8 - 3m -3 x 5 (calculate the product /quotient) 8 – 3m – 15 (collect like terms) -7 – 3m

7. Write the mathematical statement shown on the number line below



Solution process

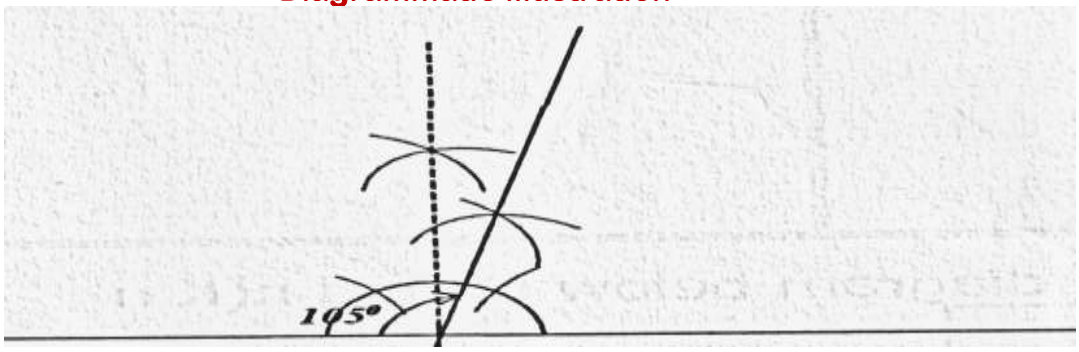
$^{-}2 - ^{-}5 = +3$

8 Using a Pair of compasses, a sharp pencil, construct an angle of 105°

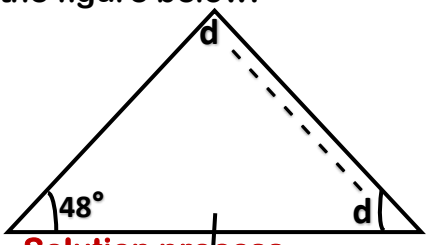
Solution process

(a)Draw a line segment using a pencil and a ruler. (b) Using a compass, draw an arc centred at one end point of the line segment. (c) Draw a line segment connecting the end point of first line segment and the intersection of the two arcs, this creates 60° angle. (d) Using the compass, draw an arc centred at the vertex of the 60° angle, intersecting both sides of the angle. (e) With out changing the compass width, place the compass point on the intersection of the arc and on one side of the triangle, draw another arc that intersects the first arc. (f) Draw a line segment connecting the vertex of the 60° angle and the intersection of the 60° and intersection of the arcs. this creates 90°. (g) Bisect the 30° angle formed between 60° and 90° angles. to do this place the compass point at the vertex of 30° angle and draw an arc that intersects all sides of the angle. (h) With out changing the compass width, place the compass on each intersection point and draw two arcs that intersects each other. (i) Draw a line segment connecting the vertex of the 30° angle and the intersection of the two arcs. This bisects 30° creating 15° angle. (j) Add 15° angle of the 90° angle to create 105° angle.

Diagrammatic illustration



9 Find the size of the angle marked D in the figure below.



Solution process

d + d +48° = 180°

2d + 48° = 180°

2d +48° = 180° - 48°

$\frac{2d}{2} = \frac{132°}{2}$

d= 66°

10 Express 120% as a fraction

Solution process

$120\% = \frac{120}{100}$

$= \frac{12}{10}$

$= \frac{6}{5}$ 0r

$1\frac{1}{5}$

11 The product of two numbers is 54. The LCM of the two numbers is 18. Find the GCF.

Solution process

Product of numbers = L C M x G C F

$\frac{54}{18} = \frac{18}{18} \times$ G C F

3

G C F = 3

12 Convert 180km/hr to metres per second.

Solution process

-Identify the conversion factor. To convert km/hr to m/sec we use the conversion factors.

1km = 1000m

1hr =3600sec

-set up the conversion. we can express the conversion as follows.

180,km/hr=180,km/hr x $\frac{1000,m}{1,km}$ x $\frac{1,hr}{3600,s}$

180 x $\frac{1000}{3600}$ = 180 x $\frac{1000}{3600}$ = 180 x $\frac{1}{3.6}$ =50

Therefore, speed of 180km/hr is equivalent to 50m/sec

13 Akello and Sarah shared 72 oranges in the ratio of 7:5 respectively. How many did each get?

Solution process

Akello : Sarah

7 : 5

Total ratio = 12

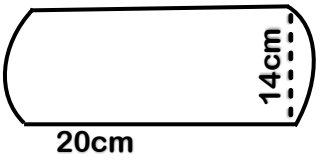
Akello will get $\frac{7 \times 72^{6}}{12}$

Akello got 42 oranges

Sarah will get $\frac{5 \times 72^{6}}{12}$

Sarah got 30 oranges

14 Find the area of the figure below.



Solution process

Since the figure has three parts, that is to say 1 rectangle and 2 semi circles where 1semi circle is visible and another one to be created at the extreme opposite of the physical semi circle as in the figure above. therefore, we shall calculate each part separately and later we sum them up to get the total area of the figure as in A, B & C.

Let the area of rectangle be "A"

A = L x W

A = (20 x14)cm

A = 280cm^2

Let the area of semi circle 1 be "B"

Diameter = 14cm (1 diameter = 2 radius)

Radius = $\frac{14cm}{2}$ =7cm

Area = $\frac{1}{2} \times \frac{11}{22} \times 7 \times \frac{1}{7}$

A = 77cm^2

Total area of 2 semi circles = area of semi circle 1(77cm) x 2 = 154cm^2

Area of the whole figure will equal to summation of all the three parts of the above figure as in below

Area A +(Area B x 2)

280cm^2 + 154cm^2

Total area =434cm^2

15 The total mass of 4 girls is 146kg. The average weight of three of them is 36.1kg. Find the mass of the forth girl.

Solution process

Total mass of three girls

= 36.1

x 3

108.3 kg

Mass of 4 girls

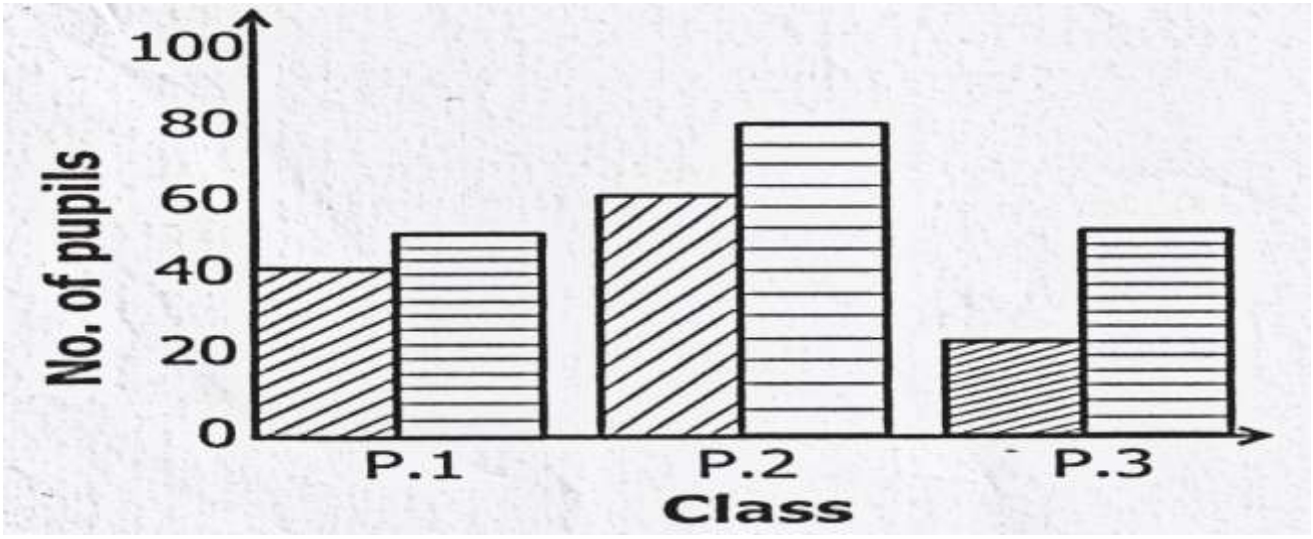
146.0

-108.3

37 .7

The fourth girl's mass will be 37.7kg

16 **The graph below shows the number of pupils, boys and girls respectively in a lower section on Divine Nursery and Primary school.**



KEY

BOYS

GIRLS

Express the number of pupils in p.2 as a percentage of the total number of pupils in lower primary.

Solution process

Number of pupils in P.1
40 + 50
90pupils
Number of pupils in P.2
60 + 80
140pupils
Number of pupils in P.3
20 + 50
70pupils

Total number of pupils in school

140 + 90 + 70

300pupils

Percentage of P.2

$\frac{140}{300} \times 100\%$

46.6%

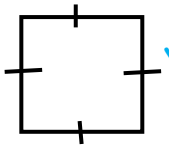
17 **Kisambira bought a phone at 80,000/= and sold it at 110,000/=. What profit did he make?**

Solution process

Buying price = 80,000/=
Selling price = 110,000/=
Profit = Spx – Bpx
Where Spx = Selling price
Bpx = Buying price
Profit = selling price – Buying price
Profit = 110,000 – 80,000
Arrange vertically

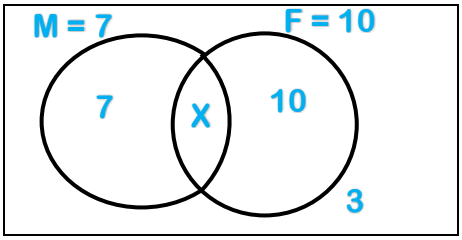
$$\begin{array}{r} 110{,}000 \\ -80{,}000 \\ \hline 30{,}000 \end{array}$$

Kisambira made 30,000//= as profit

18	**Use the distributive property to work out: (8÷3) + (10÷3)** **Solution process** (8 + 10) ÷3 18÷3 = 6	19	**The area of a square is 64cm^2. Find the length of each side of the square.** **Solution process** Let each side be y  Ycm Y x Y = Area $\sqrt{Y^2}$ =$\sqrt{64}$ $\sqrt{Y\ x\ Y}$ = $\sqrt{2\ x\ 2\ x\ 2\ x\ 2}$ Y = 8 Therefore, each length is equal to 8cm.

20	**Andrew bought a car on loan from pride microfinance worth 400,000/= at an interest rate of 5% per annum for 6 months. Calculate the simple interest.** **Solution process** SI = P x T x R Where; SI = Simple interest P = Principle (Borrowed money) T = Time (Duration to refund the borrowed money) R = Rate (Percentage at which the borrowed money is to be refunded) NOTE: Rate is always divided by 100 SI = P x $\frac{R}{100}$ x T SI = 400,~~000~~ x $\frac{~~6~~^{1}}{~~12~~_{2}}$ x $\frac{5}{~~100~~_{1}}$ 4,000 x 5 = $\frac{20,000}{2}$ = 10,000/= Therefore, simple interest to be paid by Andrew will be 10,00/=

SECTION B 5 MARKS EACH (60 MARKS)

21	**At a party of 16 guests, 7 ate meat (M), 10 ate fish (F), 3 did not eat yet X guests ate both.** **(a) Represent the above information on a Ven diagram.** **Solution process** £ = 16  **(b) Find the value of X.** **Solution process** (7 – X) + X + (10 – X) + 3 = 16 -X + 7 + 10 + 3 = 16 -X + 20 – 20 = 16 - 20 $\frac{-X}{-1} = \frac{-4}{-1}$ X = 4 **c) Find the number of those who ate only one item.** **Solution process** Only meat (7 – X) = 7 – 4 = 3 Only fish (10 – X) = 10 – 4 = 6 Those who ate only one item = 3 + 6 = 9guests = 9 guests ate one item

22 Manyanyage bought 120 mangoes at school shs 120 per mango and 30 onions at shs 400 each. He later sold each mango at shs 150 and each onion at shs 500.
(a)Calculate the percentage profit Manyanyage made.

Solution process

Cost of mangoes
Shs 120 x 120
Shs 14400

Cost of onions
Shs 400 x 300
Shs 12000

Total cost of two items
Shs 14400 + shs 12000
Arrange vertically

14400
+12000
Shs 26400

Total profit
Shs 300 + shs 3600
Arrange vertically
Profit on mangoes shs 3600
Profit on onions shs +300
Shs 6600

Profit on mangoes

Shs 120 x (150 -120)

120 x shs 30

Shs 3600 30 x (shs 500-shs 100)

30 x shs 100 = shs 3000

Percentage profit will equal to

Total profit divided by total cost of all the two items multiplied by 100% in summary

Total profit = 6600

Total cost of 2 items 26400

Percentage = 100%

Shs ~~6600~~ x ~~100%~~

~~24600~~ 25%

Percentage profit is 25%

23(a) Alex sold an article at sh. 21,000 and made a profit of 20%. Calculate the cost price of the article.

Solution process

Cost price = 100%
Profit = 20%
Selling price = cost price + profit
= (100% + 20%) of the cost price (CP)
Sh.21,000 = is 120 of the cost prices (CP)
100
Sh. 21,000 = 12 of CP
10 1
21,000 X 10 = 12 CP x ~~10~~
~~10~~ 1
3500 ~~5~~
~~21,000~~ x ~~10~~ = ~~12~~ CP
~~12~~ ~~12~~
~~6~~ 1
1

The total cost is = 3500 x 5

= sh. 17,500

(b) Brenda sold a pair of shoes at sh.45,000, she made a loss of 10%. Calculate the cost price of the pair of shoes. How much money did she lose?

Solution process

Cost price = 100%
Loss = 10%
Selling price = (100% -10%) of the cost price

Sh. 45,000 = 90/100 of the cost prices

Sh. = 45,000 = 9/10 of the cost prices

45,000 x 10 = 9 CP x 10/10

45,000/9 x 10 = 9CP/9

5,000 x 10 = CP

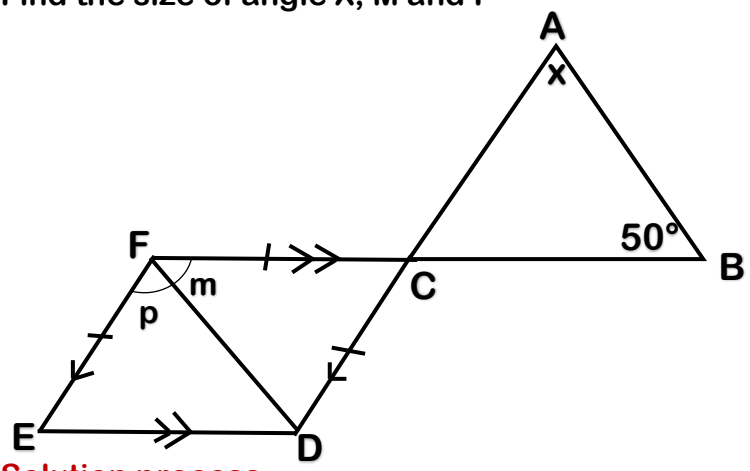
50,000 = CP

The cost price = 50,0000

The loss = (50,000 – 45,000)

= sh. 5000

24 Find the size of angle X, M and P



Solution process

Since CF = CD

Therefore angle CFD = angle CDF = m (Base angles of Isosceles Δ)

But angle FCD = 70°

Hence m + m + 70° = 180° (Angle sum of Δ)

2m + 70° = 180°

2m + 70°-70° = 180° -70°

2m =110°

$\frac{1}{2}m = \frac{55}{2}110°$

M = 55°

Since CF = DE

Therefore, angle CFD = angle FDE = m (Alternate angles)

But angle m =55°

Hence angle p + 70° + 55° = 180° (angle sum of Δ)

P + 125° =180°

P + 125° = 180° -125°

P = 55°

Angle DEF = angle FCD = 70° (alternate int angles)

FC = ED

Angle ACB = angle FCD = 70° (Vertically opposite angles)

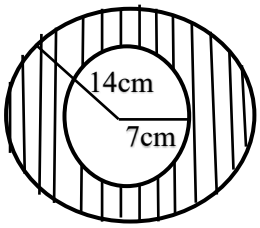
X + 50° + 70° = 180° (interior angle sum of Δ)

X + 120° = 180°

X = 180° - 120°

X = 60°

25 Find the area of the shaded part in the figure.



Solution process

Area of shaded part = Area of outer circle – Area of the inner circle

Area of the outer circle

$= \pi R^2$

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

$= 22 \times 2 \times 14cm^2$

$= 44 \times 14cm^2$

$= 616cm^2$

Area of the inner circle

$= \pi R^2$

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

$= (22 \times 7)cm^2$

$= 154cm^2$

Therefore, the Area of the shaded part

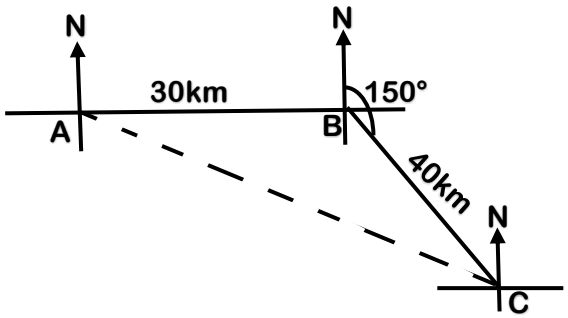
$= 616 - 154$

$= 462cm^2$

26 Town A is 30km West of town B and town C is 40km from B on a bearing of 150°. Using a scale 1cm = 10km, what is the shortest distance between town A and town C?

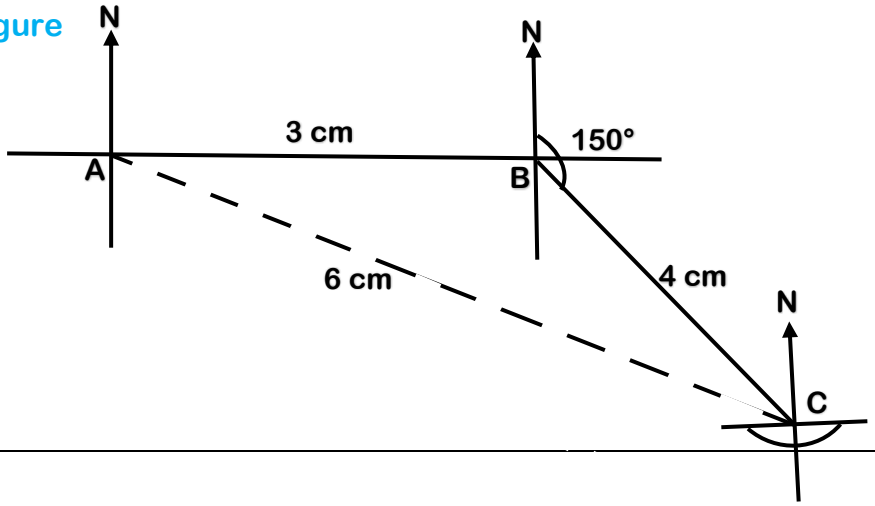
Solution process

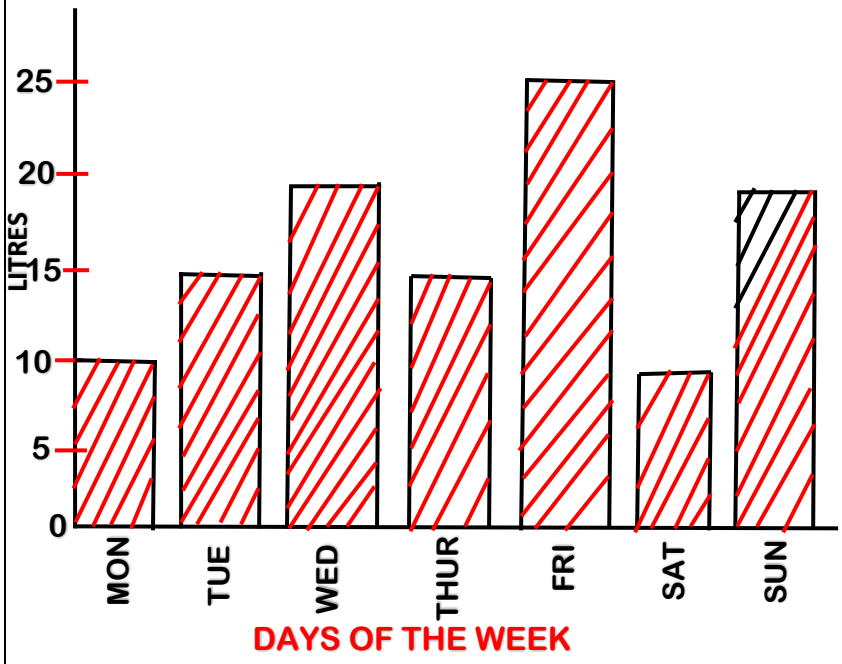
Sketch



Distance	Actual distance	Bearing	Drawing length
From A to B	30 km	090°	$\frac{30}{10}$ = 3cm
From B to C	40 km	150°	$\frac{40}{10}$ = 4cm

Actual figure



	The shortest distance between A and C = 6 cm (in drawing length) = (6 x 10) Actual distance = 60 km
27	The graph below represents the amount of milk in litres got from a cow on different days of the week.  a) On which day of the week did the cow give more milk? It was Friday b) Find the median of the milk collected in the week. Solution process ~~10~~, ~~15~~, ~~20~~, 15, ~~25~~, ~~10~~, ~~20~~ Median =15 c) What was the least number of litres produced? It was 10 d) What is the range in the milk production? Solution process Range = highest – Lowest = 25 – 10 Range = 10 e) Find the total number of litres produced by the cow in the week. Solution process 10 + 15 + 20 + 15 + 25 + 10 + 20 = 115litres
28	Given 9, 2, 6, 5, 6, 3 and 4, Work out; a) The mean Solution process Mean = $\frac{\text{Total of score}}{\text{Number of scores}}$ = $\frac{9 + 2 + 6 + 5 + 6 + 3 + 4}{7}$ = $\frac{35}{7}$ Mean = 5

b) The Mode

Solution process

Scores	freq
9	1
2	1
6	2
5	1
3	1
4	1

6 is the mode

c) The range

Solution process

Range = highest – Lowest

= 9 – 2

Range = 7

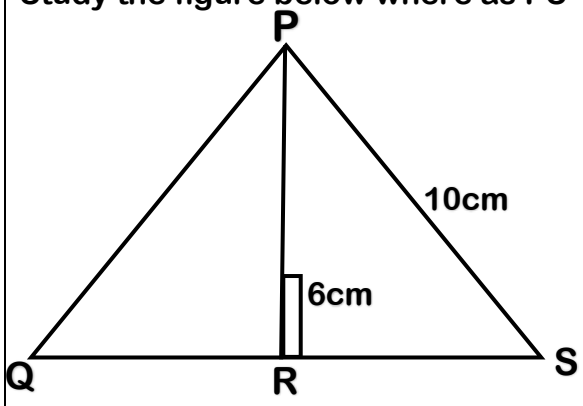
d) Median

Solution process

Median = ~~2~~, ~~3~~, ~~4~~, 5, ~~6~~, ~~6~~, ~~9~~

Median = 5

29 Study the figure below where as PS = PQ = 10cm, PR = 6cm and bisect < P



a) Find the length of QS.

Solution process

PR = 6cm

PS = 10cm RS^2

$+6^2 = 10^2$

$RS^2 + 6 \times 6 = 10 \times 10$

$RS^2 + 36 = 100$

$RS^2 + 36 - 36 = 100 - 36$

$\sqrt{RS^2} = \sqrt{65}$

$\sqrt{RS} \times RS = \sqrt{8} \times 8$

RS = 8cm

The length of QS = 8cm x 2

QS = 16cm

b) Calculate the perimeter of the figure.

Solution process

P = sum of all sides

= 16cm + 10cm + 10cm

= 26cm + 10cm

= 36cm

c) Find the area of the figure.

Solution process

Base = 16cm height

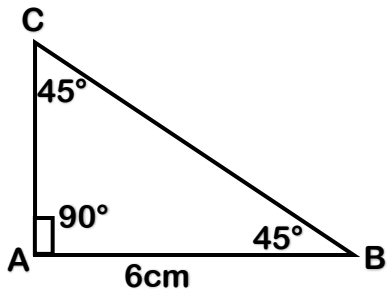
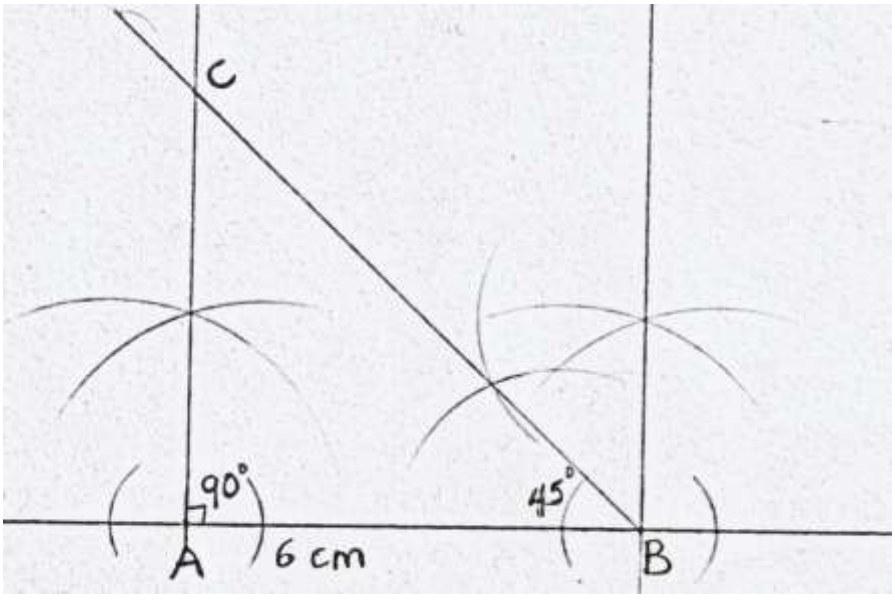
= 6cm Area

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

$= \frac{1}{2} \times 16cm \times 6cm$

= 8cm x 6cm

$= 48cm^2$

30	**Joel deposited sh. 120,000 in the bank that offers an interest rate of 10% per year.** **a)Calculate the interest got after 2 years.** **Solution process** **SI = P x T x R** **SI stands for Simple Interest** **P stands for Principal** **T stands for Time** **R stands for Rate** **SI = P x T x R** **= 120,000/= + 2 x $\frac{10}{100}$** **= 1200 x 10 x 2** **= 24,000/=** **b) Calculate the amount collected after 2 years.** **Solution process** **Amount = principal + Interest** **= 120,000/= + 2400/=** **= 144,000/=**
31	**Construct triangle ABC where line AB = 6cm, angle A = 90° and angle B = 45°. Measure line AC, BC, and angle C.** **Solution process** **Sketch**  **ACTUAL FIGURE** 
32	**When 240 is decrease it becaomes 192. Calculate yhe percentage decrease.** **Solution process**

Let the decrease be X%

New number

192 = (100% - X%) of 240

192 = $(\frac{100}{100} - \frac{x}{100})$ X 240

192 = $(\frac{\cancel{100}}{\cancel{100}}$ X 240) – $(\frac{x}{\cancel{100}}$ X $\cancel{240})$

192 = 240 - $\frac{24x}{10}$

192 – 240 = 240 – 240 - $\frac{24x}{10}$

-48 = $\frac{-24x}{10}$

-48 x 10 = $\frac{-24x}{\cancel{10}}$ x $\cancel{10}$

-480 = -24x

$\frac{\overset{20}{\cancel{-480}}}{\underset{1}{\cancel{-24}}} = \frac{\overset{1}{\cancel{-24}x}}{\underset{1}{\cancel{-24}}}$

20 = X

Therefore, X = 20%