UNIQUE STAR
EXAMINATIONS BOARD - USEB

2024

PRE PLE SOLUTION

MATHEMATICS SET 2

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Note:
All concepts in this item have been extracted from the **UNIQUE UPPER PRIMARY MATHEMATICS PUPIL'S RESOURCE BOOK**. All challenging MTC problems were solved.

Author: **Sseggayi Benjamin Kasuka**
Volume: **834 pages**
Price: **sh 80,000 only**

Other services offered:
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SECTION A : 40 MARKS

Answer **all** questions in this section

Questions **1** to **20** carry two marks each

1. Work out: 23×3

Method 1

$$\begin{array}{r} 2\ 3 \\ \times\ 3 \\ \hline 6\ 9 \end{array}$$

Method 2

23×3

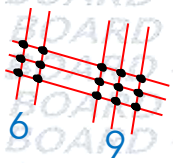
$(20 + 3) \times 3$

$3(20 + 3)$

$60 + 9$

69

Method 3



$23 \times 3 = 69$

Method 4

$23 \times 3 = 3 \times 23$

Commutative Property

$3 \times 23 = 23+23+23$

$= 69$

2. Write 301,014 in words.

Three hundred one thousand, fourteen

3. Work out: $3 - 4$ (finite 7)

Method 1

$3 - 4$ (finite 7)

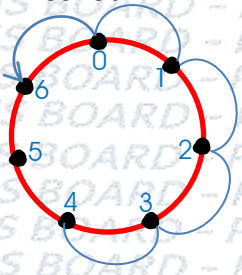
$(3+7) - 4$ (finite 7)

$10 - 4$ (finite 7)

6 (finite 7)

$3 - 4 = 6$ (finite 7)

Method 2



$3 - 4 = 6$ (finite 7)

4. Solve the equation: $8m - 2 = 14$

$$8m - 2 = 14$$
$$8m - 2 + 2 = 14 + 2$$
$$8m = 16$$
$$\frac{8m}{8} = \frac{16}{8}$$
$$m = 2$$

5. Simplify: $2^{11} \div 16$

Method 1

$2^{11} \div 16$

$2^{11} \div 2^4$

2^{11-4}

2^7

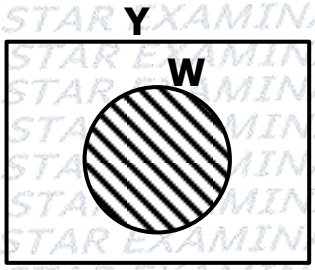
2	16
2	8
2	4
2	2
	1

$2 \times 2 \times 2 \times 2 = 2^4$

Method 2

$$2^{11} \div 16 = \frac{2\times2\times2\times2\times2\times2\times2\times2\times2\times2\times2}{2\times2\times2\times2}$$
$$= 2\times2\times2\times2\times2\times2\times2$$
$$= 2^7$$

6. Describe the shaded region in the Venn diagram below.



Set W / W∩ Y / Y∩W

7. Express 0.0406 in standard form.

$0.0406 \times 10 = 0.406$

$0.406 \times 10 = 4.06$

4.06×10^{-2}

8. Kifule made a profit of sh 2100 on a dress and this was 35% of the cost price of the dress. Calculate the amount of money Kifule sold the dress.

100% + 35% = 135%

35% represent sh 2100

1% represents sh 2100 ÷ 35

1% represents sh 60

135% represent sh 60 x 135

135% represent sh 8100

9. Write 00 45 hours in the 12 hour clock.

00 45 hours = 12:45 a.m.

10. Simplify: $\frac{2}{3} \times 2\frac{1}{4}$

$\frac{2}{3} \times 2\frac{1}{4}$

$\frac{\cancel{2}^{1}}{\cancel{3}_{1}} \times \frac{\cancel{9}^{3}}{\cancel{4}_{2}}$

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

$\frac{3}{2}$

$1\frac{1}{2}$

11. Express 464 as Roman numerals.

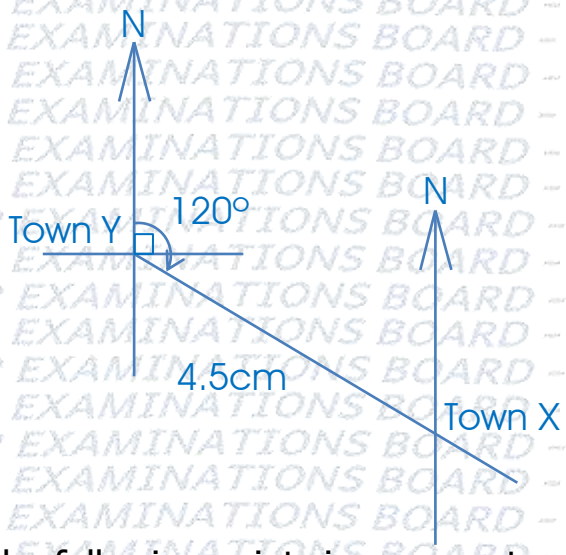
464 = 400 + 60 + 4

↓ ↓ ↓

CD LX IV

464 = CDLXIV

12. On a map, Town X is 4.5 cm away from town Y on a bearing of 120º. Using a ruler, a protractor and a pencil only, locate the two towns.



13. A girl scored the following points in a computer game:

111, 108, 118, 111, 115, 119

Find her median score.

~~108~~, ~~111~~, 111, 115, ~~118~~, ~~119~~

$\frac{111 + 115}{2}$

$\frac{226}{2}$

113

Her median score was 113

14. Given that a = 6, b = 4 and c = 3. Find the value of c + b + 2(b – a)

c + b + 2(b – a)

3 + 4 + 2(4 – 6)

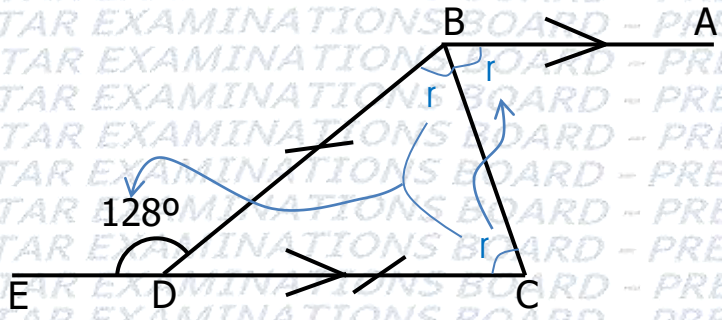
3 + 4 + (2 × -2)

3 + 4 + (-4)

7 – 4

3

15. Study the figure below carefully and use it to answer the question that follows.



Find in degrees, the size of angle ABC.

Let angle DCB be r

r + r = 128° (Two int. ∠s add up to one opp. Ext. ∠)

$\frac{2r}{2} = \frac{128°}{2}$

r = 64°

DCB = DBC = ABC

So, ABC = 64°

16. A girl ran 5 times around a circular track of diameter 42 metres.

Find in metres, the distance the girl covered. (Use π as $\frac{22}{7}$)

Distance = πd × 5

Distance = $\frac{22}{7}$ × 42m × 5

Distance = 22 × 6m × 5

Distance = 660m

The girl covered 660 metres

17. Ten cylindrical tins of volume 45cm^3 each were packed in a rectangular box leaving un occupied space of 125cm^3. Find the volume of the rectangular box.

Volume of tins in the box

10 × 45cm^3 = 450cm^3

Volume of the box

450cm^3 + 125cm^3 = 575cm^3

18. Julie went to a shop with enough money to buy 22 pens at sh 500 each. She found out that the price of each pen was increased by sh 50. How many pens did she buy?

Amount of money she had
Sh 500 × 22 = sh 11000

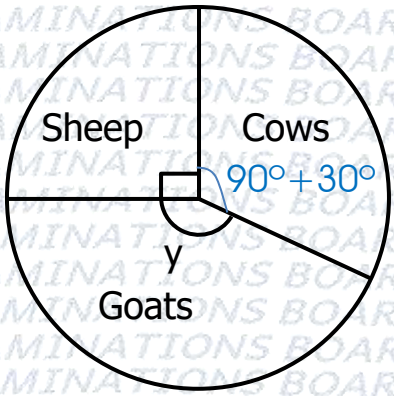
Number of pens she bought
sh 11000 ÷ (sh 500 + sh 50)
sh 11000 ÷ sh 550
20 pens

19. Find the lowest common multiple (LCM) of 18 and 30.

Multiples of 18 = 18, 36, 54, 72, 90, 108 …
Multiples of 30 = 30, 60, 90 …

LCM = 90

20. The pie chart below represents the 72 animals on a certain farm. There are 6 more cows than sheep on that farm.



Find the value of y in degrees.

$\frac{6}{72} \times 360° = 30°$

$y + 90° + (90° + 30°) = 360°$
$y + 90° + 120° = 360°$
$y + 210° = 360°$
$y + 210° - 210° = 360° - 210°$
$y = 150°$

SECTION B: 60 MARKS

Answer **all** questions in this section

Marks for each question are indicated in brackets

21. (a) Work out: $143_{five} + 4_{five}$ (02 marks)

$$\begin{array}{r} 1\,4\,3_{five} \\ +\quad 4_{five} \\ \hline 2\,0\,2_{five} \end{array}$$

$7 \div 5 = 1$ remainder 2

$5 \div 5 = 1$ remainder 0

(b) Change to base two, the number expanded below:

$(1 \times 4^2) + (3 \times 4^0)$ (02 marks)

$(1 \times 4^2) + (3 \times 4^0)$

$(1 \times 4 \times 4) + (3 \times 1)$

$16 + 3$

19_{ten}

19_{ten} to base two

Base	Number	Rem
2	19	1
2	9	1
2	4	0
2	2	0
2	1	1
	0	

$19_{ten} = 10011_{two}$

22. (a) Express 6.666... as a rational number. (02 marks)

Let the rational number be n

$n = 6.666$ .....(i)

$10 \times n = 10 \times 6.666...$

$10n = 66.666...$ (ii)

(ii) – (i)

$10n = 66.666...$

$-\ n = 6.666...$

$9n = 60.000$

$\frac{9n}{9} = \frac{60}{9}$

$n = \frac{20}{3}$

$n = 6\frac{2}{3}$

$6.666... = 6\frac{2}{3}$

(b) Simplify: $0.18 \div \frac{3}{4}$ of 0.4 (03 marks)

$0.18 \div \frac{3}{4}$ of 0.4

$(\frac{18}{100} \div \frac{3}{4})$ of $\frac{4}{10}$

$\frac{18}{100} \times \frac{4}{3}$ of $\frac{4}{10}$

$\frac{24}{100} \times \frac{4}{10}$

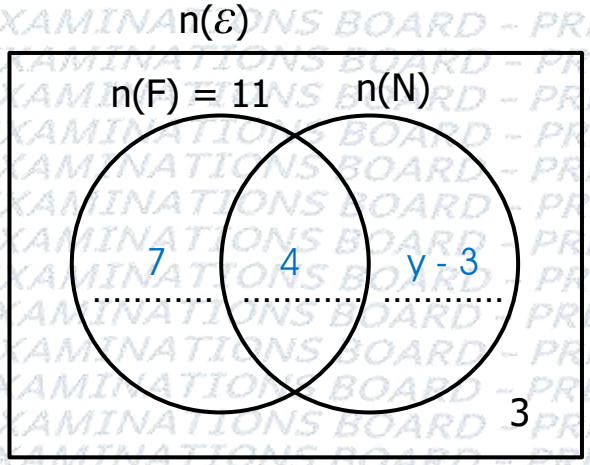
$\frac{24 \times 4}{100 \times 10}$

$\frac{96}{1000}$

0.096

23. In a sports club, 11 members play football (F), 7 play football but not netball (N), 3 play neither of the two games while y do not play football.

(a) Use the given information to complete the Venn diagram below. (03 marks)



(b) Given that 9 members play netball altogether, find the value of y. (02 marks)

$y - 3 + 4 = 9$

$y + 1 = 9$

$y + 1 - 1 = 9 - 1$

$y = 8$

24. The interior angle of a regular polygon is 135º.

(a) Name the polygon. (03 marks)

Each ext. angle

$180° - 135° = 45°$

Number of sides

$\frac{360}{45} = 8$ sides

The polygon is an Octagon

(b) Find the sum of all interior angles of the polygon. (02 marks)

$180°(n - 2)$

$180°(8 - 2)$

$180° \times 6$

$1080°$

Method 2

$135° \times 8$

$1080°$

25. A business woman went to a bank and withdrew sh 244,000 in different denomination as shown in the table below.

Number of notes	Value of each note	Amount
7	Sh 20,000	Sh 140,000
8	Sh 5,000	Sh 40,000
32	Sh 2,000	Sh 64,000

(a) Complete the table above. (04 marks)

Sh 20000 × 7

sh 140000

Sh 140000

+Sh 40000

Sh 180000

Sh 244000

- Sh 180000

Sh 64000

$\frac{\text{Sh } 64000}{\text{Sh } 2000} = 32$

$\frac{\text{Sh } 40000}{8} = \text{Sh } 5000$

(b) If 2,000 shilling notes were numbered consecutively to AX2640030. Find the identification number for the first note. (02 marks)

$32 - 1 = 31$

AX2640030

- 31

AX2639999

26. In a village, a third of the farmers grow maize, 25% grow cassava, 40% of the remaining farmers grow beans and the rest of the farmers grow millet.

(a) Find the fraction of farmers who grow beans. (03 marks)

Maize and Cassava

$\frac{1}{3} + \frac{25}{100}$

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

$\frac{4 + 3}{12}$

$\frac{7}{12}$

Remainder

$\frac{12}{12} - \frac{7}{12} = \frac{5}{12}$

Beans

$\frac{40}{100} \times \frac{5}{12}$

$\frac{1}{6}$

(b) Given that 150 farmers grow millet. Find the number of farmers who grow maize. (03 marks)

Fraction for farmers who grow millet

$\frac{5}{12} - \frac{1}{6} = \frac{5 - 2}{12}$

$= \frac{3}{12}$

$= \frac{1}{4}$

Total number of famers

1 part represents 150

4 parts represent 4×150

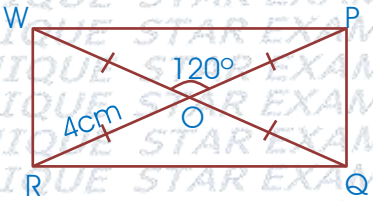
4 parts represent 600 famers

Number of farmers who grow maize

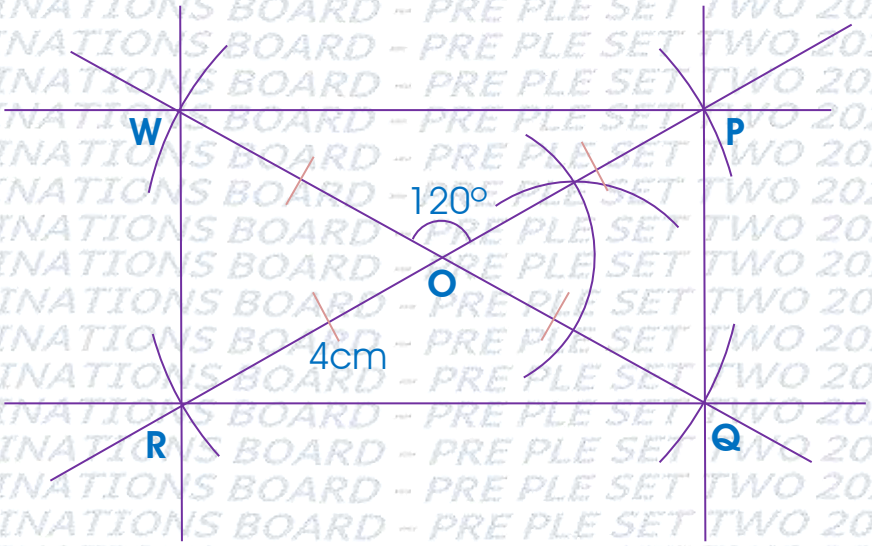
$\frac{1}{3} \times 600 = 200$ farmers

27. (a) Using a ruler, a pencil and a pair of compasses only, construct a quadrilateral WPQR whose diagonals WQ and RP intersect at point O, angle WOP = 120º and diagonal WQ = RP = 8cm. (04 marks)

Sketch



Accurate diagram



(b) Measure line PQ (01 mark)

PQ = 4cm

28. A motorcyclist covered 54 kilometres from 12:30 p.m. to 2:00 p.m. Calculate the speed of the motorcyclist in metres per second. (04 marks)

2 : 00
+12 : 00
14 : 00
-12 : 30
1 : 30
1 hour 30 minutes
$1\frac{1}{2}$ hours

Distance in metres
54 × 1000m = 54000m

Time in seconds
$1\frac{1}{2}$ × 3600 seconds
$\frac{3}{2}$ × 3600 seconds
5400 seconds

Speed in m/s

$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$

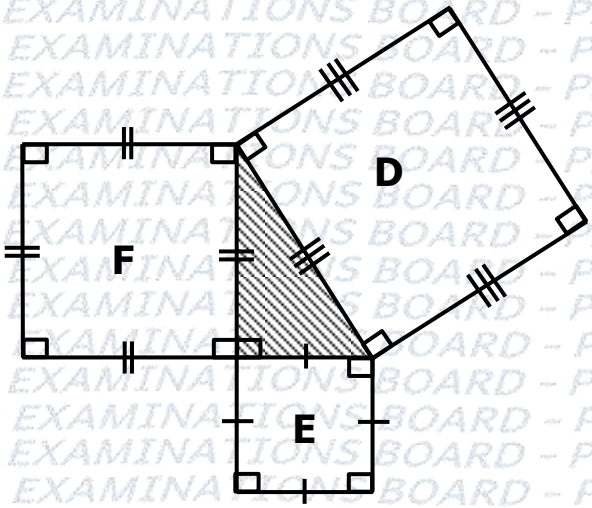
$\text{Speed} = \frac{540000\text{m}}{5400\text{s}}$

Speed = 10m/s

29. The area of each of the squares D and E is given below:

Square D = $100cm^2$
Square E = $36cm^2$

Study the figure carefully and use it to answer questions that follow.



Find in square centimetres the area of

(i) square F. (01 mark)

$100cm^2 - 36cm^2 = 64cm^2$

(ii) the shaded part. (04 marks)

Base

side × side = Area

$b \times b = 36cm^2$

$b^2 = 36cm^2$

$\sqrt{b^2} = \sqrt{36cm^2}$

$b = 6cm$

Height

side × side = Area

$h \times h = 64cm^2$

$h^2 = 64cm^2$

$\sqrt{h^2} = \sqrt{64cm^2}$

$h = 8cm$

Area of the shaded part

$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$

$\text{Area} = \frac{1}{2} \times 6cm \times 8cm$

$\text{Area} = 3cm \times 8cm$

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

30. Birasa is 40 years older than Cate. In 6 years' time, Cate will be a sixth of Birasa's age.

How old is Birasa now? (04 marks)

Let Cate's age now be y

	Cate	Birasa
Now	y	y+40
6year's time	y+6	y+46

Value of y

$$y + 6 = \frac{1}{6}(y+46)$$

$$(y\times6) + (6\times6) = 6\times\frac{1}{6}(y+46)$$

$$6y + 36 = y + 46$$

$$6y - y + 36 = y - y + 46$$

$$5y + 36 = 46$$

$$5y + 36 - 36 = 46 - 36$$

$$5y = 10$$

$$\frac{5y}{2} = \frac{10}{2}$$

$$y = 2$$

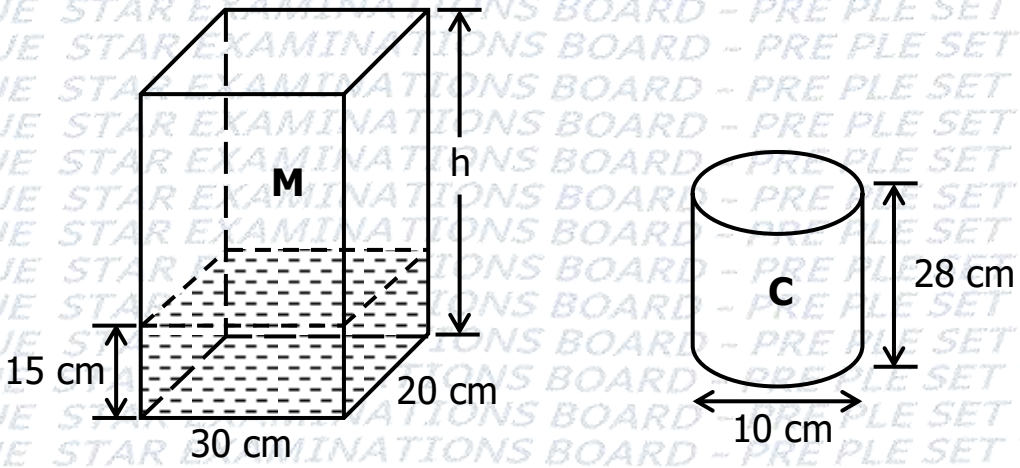
Birasa's age now

(y+40) years

(2 + 40) years

42 years

31. In the figure below, M is a water tank and C is a cylindrical container. Tank M needs 15 full containers of size C to become full.



(a) Calculate the volume of container C. (Take $\pi = \frac{22}{7}$) (02 marks)

Volume = Base area × height

Volume = πr^2 x h

$$\text{Volume} = \frac{22}{7} \times \frac{10\text{cm}}{2} \times \frac{10\text{cm}}{2} \times 28\text{cm}$$

Volume = 22 × 5cm × 5cm × 4cm

Volume = 2200cm^3

(b) Find the value of h. (04 marks)

Volume of water in the tank

$V = l \times w \times h$

$V = 30cm \times 20cm \times 15cm$

$V = 9000cm^3$

Volume needed to fill the tank

$15 \times 2200cm^3 = 33000cm^3$

Volume of the tank

$9000cm^3 + 33000cm^3 = 42000cm^3$

Value of h

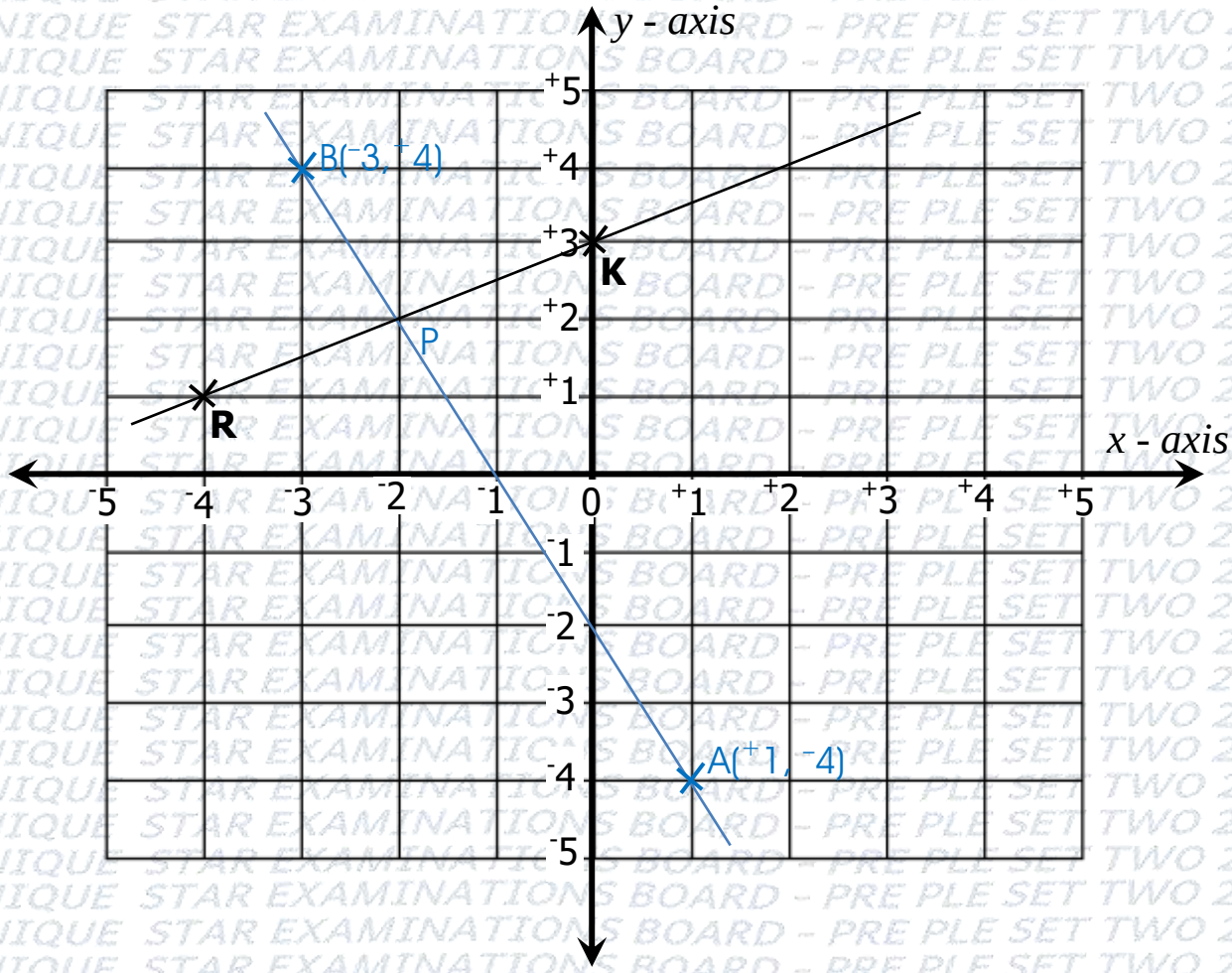
$$\text{Height} = \frac{\text{Volume}}{\text{Length} \times \text{Width}}$$

$$\text{Height} = \frac{42000}{30 \times 20}$$

Height = 70cm

h = 70cm

32. Use the co-ordinate graph below to answer questions that follow.



(a) Write the co-ordinates of point R and K. (01 mark each)

(i) R

$R(^{-}4, ^{+}1)$

(ii) K

$K(0, ^{+}3)$

(b) Plot points $A(^{+}1, ^{-}4)$ and $B(^{-}3, ^{+}4)$. (02 marks)

(c) Join point A to B such that line AB intersects RK at P. (01 mark)

(d) Write the co-ordinates of point P (01 mark)

$P(^{-}2, ^{+}2)$

END