

# Class VIII Session 2025-26

## Subject - Mathematics

### Sample Question Paper - 7

**Time Allowed: 3 hours**

**Maximum Marks: 80**

**General Instructions:**

All the questions are compulsory.

**Section A**

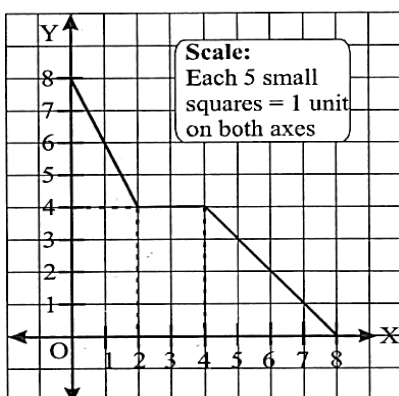
1. Choose the correct answers to the questions from the given options. [10]

(a) The following figure represents a: [1]



- a) Concave polyhedron                      b) Cylinder  
c) Polygon                                      d) Convex polyhedron

(b) [1]



Change in y when x changes from 2 to 4.

- a) 2    b) 4  
c) 0    d) 3

(c) What is the sum of the measures of the angles of a convex quadrilateral? [1]

- a)  $45^\circ$     b)  $90^\circ$   
c)  $180^\circ$     d)  $360^\circ$

(d) Solve for x: [1]

$$\frac{x+3}{2} + 3x = 5(x-3) + \frac{x+23}{5}$$

- a) 7    b) 5  
c) 18    d) 13

(e) Simplify and write in exponential form:  $(-2)^{-3} \times (-2)^{-4}$  [1]



- a)  $(-2)^{-7}$  b)  $(-2)^7$   
 c)  $(2)^7$  d)  $(2)^{-7}$
- (f) That smallest number, by which when 392 is divided, perfect cube is obtained. The numbers will be [1]  
 a) 6 b) 7  
 c) 8 d) 5
- (g) If 18 binders bind 900 books in 10 days, how many binders will be required to bind 660 books in 12 days? [1]  
 a) 11 b) 22  
 c) 13 d) 14
- (h)  $-\frac{19}{21} \times \left(-\frac{21}{19}\right) = \underline{\hspace{2cm}}$ . [1]  
 a) 21 b) 1  
 c) 19 d)  $\frac{19}{21}$
- (i)  $4x \times 5y \times 7z = ?$  [1]  
 a)  $140xy$  b) 140  
 c)  $140xyz$  d)  $140xz$
- (j) Three cubes each of side 10 cm are joined end to end. The surface area of the resultant figure is [1]  
 a)  $1400 \text{ cm}^2$  b)  $1450 \text{ cm}^2$   
 c)  $1500 \text{ cm}^2$  d)  $1550 \text{ cm}^2$

2. Fill in the blanks: [6]
- (a) The discount% on an item for sale is calculated on \_\_\_\_\_. [1]  
 (b) The least number of 6 digits which is a perfect square is \_\_\_\_\_. [1]  
 (c) The factorization of  $2x + 4y$  is \_\_\_\_\_. [1]  
 (d) If 4 km on a map is represented by 1 cm, then 16 km is represented by \_\_\_\_\_ cm. [1]  
 (e) If x – coordinate of a point is zero, then this point always lies on \_\_\_\_\_. [1]  
 (f) The polygon in which sum of all exterior angles is equal to the sum of interior angles is called \_\_\_\_\_. [1]

3. Match the following: [4]

Column A	Column B
1. $(5^3)^{-4}$	(a) $8^6$
2. $5^8 \div 5^2$	(b) $5^{-12}$
3. $4^3 \times 4^5$	(c) $5^6$
4. $(8^3)^2$	(d) $4^8$

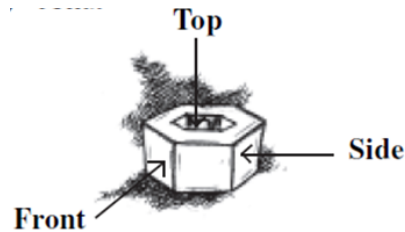
#### Section B

4. Using prime factorization, find that 343 is a perfect cube. [1]  
 5. Sobi types 108 words in 6 minutes. How many words would she type in half an hour? [1]



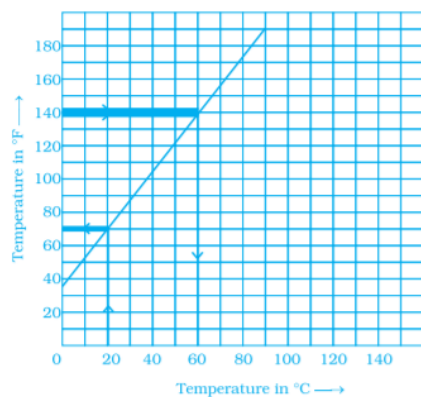
6. Simplify:  $\frac{3}{7} + \frac{-2}{21} \times \frac{-5}{6}$  [1]
7. Multiply:  $(a^2 + 2b^2)$  and  $(5a - 3b)$  [1]
8. Find the volume of cube whose edge is  $3x$ . [1]
9. In the word "EDUCATION" find the probability of getting a vowel. [1]
10. 72% of 25 students are good in mathematics. How many students are not good in Mathematics? [1]
11. Without calculating square roots, find the number of digits in the square root of 36864. [1]
12. Factorise the expression:  $7a^2 - 14a$  [1]
13. Draw the front view, side view and top view of the given object. [1]

A nut



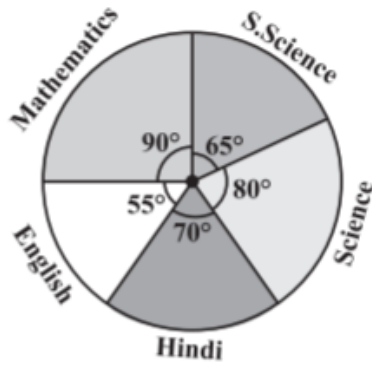
### Section C

14. The following is a conversion graph of temperature in  $^{\circ}\text{C}$  and  $^{\circ}\text{F}$ . [2]  
Use the graph to answer the following questions.
  - a. Convert  $140^{\circ}\text{F}$  to  $^{\circ}\text{C}$ .
  - b. Convert  $20^{\circ}\text{C}$  to  $^{\circ}\text{F}$



15. Three angles of a quadrilateral are equal. Fourth angle is of measure  $120^{\circ}$ . What is the measure of equal angles? [2]
16. Solve:  $10x - 5 - 7x = 5x + 15 - 8$  [2]
17. Find the value of  $(2^{-1} \times 4^{-1}) \div 2^{-2}$  [2]
18. Is 46656 a perfect cube? [2]
19. If 1 part of a red pigment requires 75 ml of the base, how much red pigment should we mix with 1800 ml of the base? [2]
20. Verify the property  $x \times (y + z) = x \times y + x \times z$  of rational number where  $x = \frac{-1}{2}$ ,  $y = \frac{2}{3}$  and  $z = \frac{3}{4}$  [2]
21. Multiply:  $\left(\frac{3}{4}x - \frac{4}{3}y\right)$ ,  $\left(\frac{2}{3}x + \frac{3}{2}y\right)$  [2]
22. Find the volume and surface area of the cube whose side length is 17cm. [2]
23. The adjoining pie chart gives the marks scored in an examination by a student in Hindi, English, Mathematics, Social Science and Science. If the total marks obtained by the students were 540, answer the question. [2]

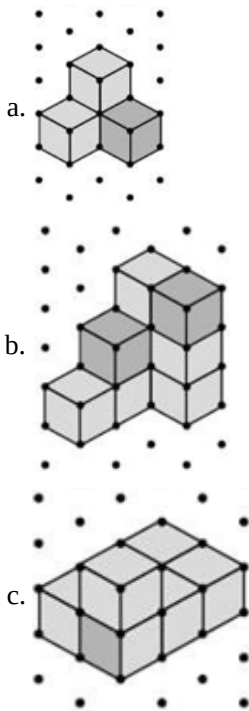




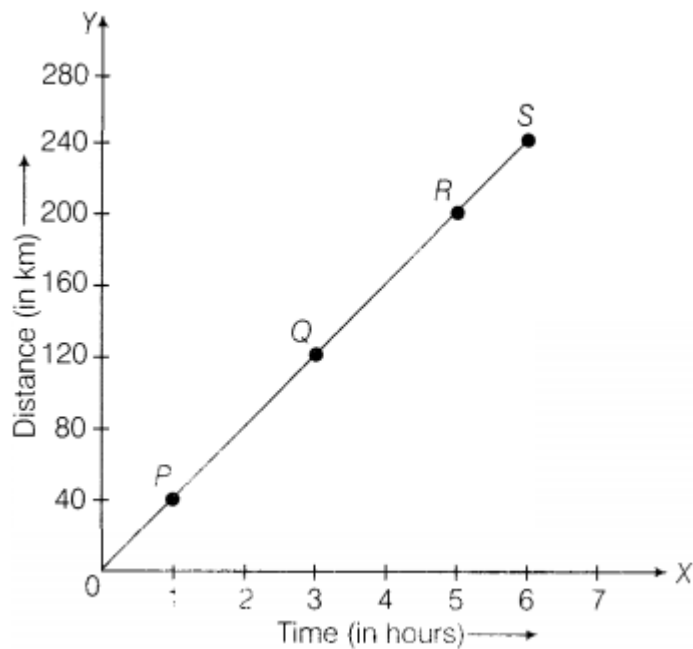
In which subject did the students score 105 marks? (Hint: for 540 marks, the central angle =  $360^\circ$ . So, for 105 marks, what is the central angle?)

#### Section D

24. The cost price of an article is ₹375. Find the marked price of the article so as to gain 8%, after allowing a discount of 25%? [3]
25. Find the least number which must be subtracted from 402 so as to get a perfect square. Also find the square root of the perfect square so obtained. [3]
26. Factorise:  $a^4 - 2a^2b^2 + b^4$  [3]
27. Count the number of cubes in each of the following blocks. [3]



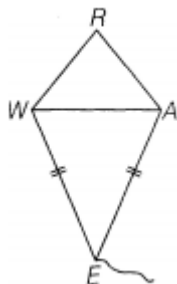
28. Study the distance-time graph given below for a car to travel to certain places and answer the questions that follow. [3]



- How far does the car travel in 2 h?
- How much time does the car take to reach R?
- How long does the car take to cover 80 km?
- How far is Q from the starting point?
- When does the car reach the place S after starting?

#### Section E

29. In kite EARW,  $\angle WEA = 70^\circ$  and  $\angle ARW = 80^\circ$ . Find the remaining two angles. [5]



30. The length and breadth of a room are in the ratio 3 : 2 and its area is  $216 \text{ m}^2$ . It is shown in a blueprint with a scale of  $1 \text{ cm} = 2 \text{ m}$ . Find the area of the room in the blue print. [5]
31. Draw a graph for the following. [5]

Side of square (in cm)	2	3	4	5	6
Area (in $\text{cm}^2$ )	4	9	16	25	36

Is it a line graph?

# Solution

## Section A

1. Choose the correct answers to the questions from the given options.

- (i) **(d)** Convex polyhedron

**Explanation:** {

Convex polyhedron, as it is bounded by plane polygonal faces.

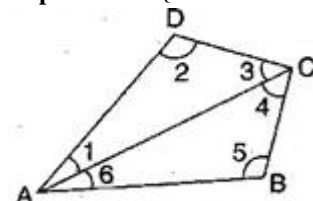
- (ii) **(c)** 0

**Explanation:** {

There is no change in Y

- (iii) **(d)**  $360^\circ$

**Explanation:** {



Let ABCD is a convex quadrilateral, then we draw a diagonal AC which divides the quadrilateral into two triangles.

$$\angle A + \angle B + \angle C + \angle D$$

$$= \angle 1 + \angle 6 + \angle 5 + \angle 4 + \angle 3 + \angle 2$$

$$= \angle(1 + 2 + 3) + \angle(4 + 5 + 6)$$

We are aware that the total sum of the interior angles of any triangle will be  $180^\circ$  and a quadrilateral is made up of two triangles

Thus, the sum of the interior angles of both the triangles are  $180 + 180 = 360^\circ$

So, the sum of the measures of the angles of a convex quadrilateral is  $360^\circ$

- (iv) **(a)** 7

**Explanation:** {

$$\begin{aligned} \frac{x+3}{2} + 3x &= 5(x-3) + \frac{x+23}{5} \\ \Rightarrow \frac{x+3+2(3x)}{2} &= \frac{25(x-3)+x+23}{5} \\ \Rightarrow 5[x+3+6x] &= 2[25x-75+x+23] \\ \Rightarrow 35x+15 &= 52x-104 \Rightarrow 52x-35x=15+104 \\ \Rightarrow 17x &= 119 \Rightarrow x=7 \end{aligned}$$

- (v) **(a)**  $(-2)^{-7}$

**Explanation:** {

$$(-2)^{(-3-4)} = (-2)^{(-7)}$$

- (vi) **(b)** 7

**Explanation:** {

Factors of 392

2	392
2	196
2	98
7	49
7	7
	1

$$392 = 2 \times 2 \times 2 \times 7 \times 7$$

If we multiply 392 by 7, it will become a perfect cube.

(vii) (a) 11

**Explanation:** {

Let required number of binders be 'x'

Less books, less binders (direct)

More days, less binders (indirect)

$$\left. \begin{array}{l} \text{Books} \quad 900 \quad : 660 \\ \text{Days} \quad 12 \quad : 10 \end{array} \right\} :: 18 : x$$

$$900 \times 12 \times x = 660 \times 10 \times 18$$

$$x = \frac{660 \times 10 \times 18}{900 \times 12} = 11$$

(viii) (b) 1

**Explanation:** {

$$\frac{-19}{21} \times \left(\frac{-21}{19}\right)$$

$$= \frac{399}{399}$$

$$= 1$$

(ix) (c)  $140xyz$

**Explanation:** {

$$4x \times 5y \times 7z$$

Multiply the constants and variables we get,

$$4 \times 5 \times 7 \times x \times y \times z$$

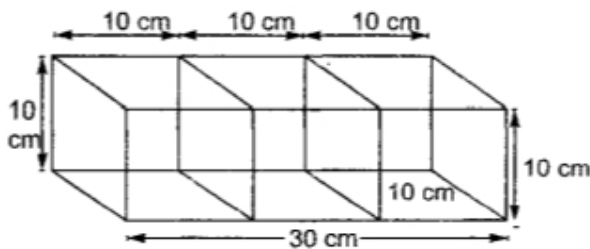
$$140xyz$$

(x) (a)  $1400 \text{ cm}^2$

**Explanation:** {

If three cubes each of side 10 cm are joined, then a cuboid will be formed of dimensions

$$30 \text{ cm} \times 10 \text{ cm} \times 10 \text{ cm}$$



$$\therefore \text{Surface area of the cuboid} = 2[lb + bh + hl]$$

$$= 2[30 \times 10 + 10 \times 10 + 30 \times 10]$$

$$= 2[300 + 100 + 300] = 2[700] = 1400 \text{ cm}^2$$

2. Fill in the blanks:

(i) 1. Marked Price

(ii) 1. 100489

(iii) 1.  $2(x + 2y)$

(iv) 1. 4

(v) 1. y-axis

(vi) 1. Quadrilateral

3. 1. (b)

2. (c)

3. (d)

4. (a)

### Section B

4. We have,  $343 = 7 \times 7 \times 7$  Since the prime factors appear in triplets.

So, 343 is a perfect cube.

5. Sobi can types 108 words in 6 min

$$\text{In 1 min, she can type} = \frac{108}{6} = 18 \text{ words}$$

$$\text{Thus, in 30 min, she can type} = 18 \times 30 = 540 \text{ words}$$

6. Given,  $\frac{3}{7} + \frac{-2}{21} \times \frac{-5}{6} = \frac{3}{7} + \frac{5}{63} = \frac{27+5}{63} = \frac{32}{63}$

7.  $(a^2 + 2b^2) \times (5a - 3b) = a^2(5a - 3b) + 2b^2(5a - 3b)$   
 $= 5a^3 - 3a^2b + 10ab^2 - 6b^3$

8. Volume = (side)<sup>3</sup>

Volume =  $(3x)^3 = 27x^3$

9. Vowel = 5

Total words = 9

probability of getting a vowel =  $5/9 = 0.5555555555555558 = 0.56$ (approx)

10. Total number of students = 25

Number of students good in mathematics = 72% of 25

$= \frac{72}{100} \times 25 = 18$

Number of students not good in mathematics =  $25 - 18 = 7$

11. 36864

By placing bars, we get  $\overline{36864}$

Since there are 3 bars, the square root will be of 3 digits.

12.  $7a^2 - 14a = 7 \times a \times a - 2 \times 7 \times a$

Taking common factors from each term,

$= 7 \times a(a - 2)$

$= 7a(a - 2)$

13. We have given a nut:



### Section C

14. From the graph it is clear that

a.  $140^\circ\text{F} = 60^\circ\text{C}$ .

b.  $20^\circ\text{C} = 70^\circ\text{F}$

15. Let the measures of equal angles be  $x^\circ$  each.

Then, by the angle sum property of a quadrilateral, we have

$x^\circ + x^\circ + x^\circ + 120^\circ = 360^\circ$

$\Rightarrow 3x^\circ + 120^\circ = 360^\circ$

$\Rightarrow 3x^\circ = 240^\circ$

$\Rightarrow x^\circ = 80^\circ$

16. Given,  $10x - 5 - 7x = 5x + 15 - 8$

$\Rightarrow 10x - 7x - 5x = 5 + 15 - 8$  [transposing  $5x$  to LHS and  $-5$  to RHS]

$\Rightarrow -2x = 12$

$\Rightarrow \frac{-2x}{-2} = \frac{12}{-2}$  [dividing both sides by  $-2$ ]

$\therefore x = -6$

17.  $(2^{-1} \times 4^{-1}) \div 2^{-2}$

$= \{2^{-1} \times (2^2)^{-1}\} \div 2^{-2}$

$= \{2^{-1} \times 2^2 \times (-1)\} \div 2^{-2}$

$= (2^{-1} \times 2^{-2}) \div 2^{-2}$

$= 2^{(-1)} \times 2^{(-2)} \div 2^{-2}$

$= 2^{-3} \div 2^{-2}$

$= \frac{2^{-3}}{2^{-2}}$

$= \frac{1}{2^{(-2)-(-3)}}$

$= \frac{1}{2^{-2+3}}$



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

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

2	46656
2	23328
2	11664
2	5832
2	2916
2	1458
3	729
3	243
3	81
3	27
3	9
3	3
	1

By prime factorisation,

$$46656 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \text{ [grouping the factors in triplets]}$$

$$= 2^3 \times 2^3 \times 3^3 \times 3^3$$

$= 36^3$  which is a perfect cube.

All the terms form triplets

Therefore, 46656 is a perfect cube.

19. Let the parts of red pigment mix with 1800 ml base be x

Parts of red pigment	1	x
Parts of base	75	1800

Since it is in direct proportion,

$$\therefore \frac{1}{75} = \frac{x}{1800}$$

$$\Rightarrow 75 \times x = 1 \times 1800$$

$$\Rightarrow x = \frac{1800}{75} = 24 \text{ parts}$$

Hence with base 1800 ml, 24 parts of red pigment should be mixed.

20. Given,  $x = \frac{-1}{2}$ ,  $y = \frac{2}{3}$  and  $z = \frac{3}{4}$

$$\text{Now, LHS} = x \times (y + z) = \frac{-1}{2} \times \left( \frac{2}{3} + \frac{3}{4} \right) = \frac{-1}{2} \times \left( \frac{8+9}{12} \right) = \frac{-17}{24}$$

$$\text{and RHS} = (x \times y) + (x \times z) = \frac{-1}{2} \times \frac{2}{3} + \left( \frac{-1}{2} \right) \times \frac{3}{4} = \frac{-1}{3} - \frac{3}{8} = \frac{-8-9}{24} = \frac{-17}{24}$$

$\therefore \text{LHS} = \text{RHS}$

Hence,  $x \times (y + z) = x \times y + x \times z$

21. We have,  $\left( \frac{3}{4}x - \frac{4}{3}y \right)$  and  $\left( \frac{2}{3}x + \frac{3}{2}y \right)$

$$\therefore \left( \frac{3}{4}x - \frac{4}{3}y \right) \left( \frac{2}{3}x + \frac{3}{2}y \right) = \frac{3}{4}x \left( \frac{2}{3}x + \frac{3}{2}y \right) - \frac{4}{3}y \left( \frac{2}{3}x + \frac{3}{2}y \right)$$

$$= \frac{3}{4} \times \frac{2}{3}x^2 + \frac{3}{4} \times \frac{3}{2}xy - \frac{4}{3} \times \frac{2}{3}yx - \frac{4}{3} \times \frac{3}{2}y^2$$

$$= \frac{1}{2}x^2 + \frac{9}{8}xy - \frac{8}{9}xy - 2y^2$$

$$= \frac{1}{2}x^2 + \left( \frac{9}{8} - \frac{8}{9} \right)xy - 2y^2$$

$$= \frac{1}{2}x^2 + \left( \frac{81-64}{72} \right)xy - 2y^2$$

$$= \frac{1}{2}x^2 + \frac{17}{72}xy - 2y^2$$

22. It is given that side length (a) = 17 cm

$$\text{Volume of the cube (V)} = a^3 = (17)^3$$

$$= 17 \times 17 \times 17$$

$$= 4913 \text{ cm}^3$$

$$\text{Surface area of the cube (A)} = 6a^2$$

$$= 6 \times (17)^2$$

$$= 1734 \text{ cm}^2$$

23. From the graph it is clear that For 540 marks, the central angle =  $360^\circ$

$\therefore$  For 105 marks, the central angle =  $\frac{360^\circ}{540} \times 105 = 70^\circ$ , hence, the student scored 105 marks in Hindi.

#### Section D

24. C.P. of the article = ₹ 375

$$\text{Gain} = 8\%$$

$$S.P. = \frac{100 + \text{Gain}\%}{100} \times C.P.$$

$$= \frac{100 + 8}{100} \times 375$$

$$= \frac{108}{100} \times 375 = ₹ 405$$

Let the marked price of the article be Rs. x

$$\text{Discount}\% = 25\%$$

$$\text{Discount} = \frac{25}{100} \times x = \frac{x}{4}$$

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

$$405 = x - \frac{x}{4} = \frac{3x}{4}$$

$$x = \frac{4 \times 405}{3} = 4 \times 135$$

$$x = ₹ 540.$$

Therefore, the marked price of the article is ₹ 540.

$$\begin{array}{r} 20 \\ 2 \overline{) 402} \\ \underline{- 4} \phantom{0} \\ 02 \\ 40 \overline{) 02} \\ \underline{- 00} \\ 2 \end{array}$$

This shows that  $20^2$  is less than 402 by 2. This means, if we subtract the remainder from the number, we get a perfect square, So, the required least number is 2.

Therefore, the required perfect square is  $402 - 2 = 400$ .

$$\text{Hence, } \sqrt{400} = 20.$$

$$26. a^4 - 2a^2b^2 + b^4$$

$$= (a^2)^2 - 2(a^2)(b^2) + (b^2)^2$$

$$= (a^2 - b^2)^2 \dots [\text{Using Identity II}]$$

$$= \{(a - b)(a + b)\}^2 \dots [\text{Using Identity III}]$$

$$= (a - b)^2 (a + b)^2.$$

27. a. 4

b. 9

c. 7

28. a. From the given graph, the car travels 80 km in 2h.

b. 5 h taken by car to reach R.

c. 2 h taken by car to cover 80 km.

d. Q is 120 km far from the starting point.

e. The car reaches the place S after starting in 6 h.

#### Section E

29. Given, in a kite EARW,  $\angle WEA = 70^\circ$ ,  $\angle ARW = 80^\circ$

$$\angle RWE + \angle WEA + \angle EAR + \angle ARW = 360^\circ [\text{by the interior angle sum property of a quadrilateral}]$$

$$\Rightarrow \angle RWE + 70^\circ + \angle EAR + 80^\circ = 360^\circ$$

$$\Rightarrow \angle RWE + \angle EAR = 360^\circ - 150^\circ$$

$$\Rightarrow \angle RWE + \angle EAR = 210^\circ$$

$$\text{Now, } \angle RWA = \angle RAW [\because RW = RA]$$

$$\text{and } \angle AWE = \angle WAE [\because WE = AE]$$

On adding Eqs. (ii) and (iii), we get  $\angle RWA + \angle AWE = \angle RAW + \angle WAE$

$$\Rightarrow \angle RWE = \angle RAE$$

From Eq. (i),

$$2\angle RWE = 210^\circ$$

$$\angle RWE = 105^\circ \Rightarrow \angle RWE = \angle RAE = 105^\circ$$

30. Let the length and breadth of the room be  $3x$  and  $2x$  respectively

$$\text{Area of the room} = \text{length} \times \text{breadth} = 216 \text{ m}^2$$

$$= 3x \times 2x = 6x^2 = 216$$

$$x^2 = \frac{216}{6} = 36$$

$$x^2 = \frac{216}{6} = 36$$

$$x = \sqrt{36} = 6 \text{ m}$$

$$\text{Length} = 3x = 3 \times 6 = 18 \text{ m}$$

$$\text{Breadth} = 2x = 2 \times 6 = 12 \text{ m}$$

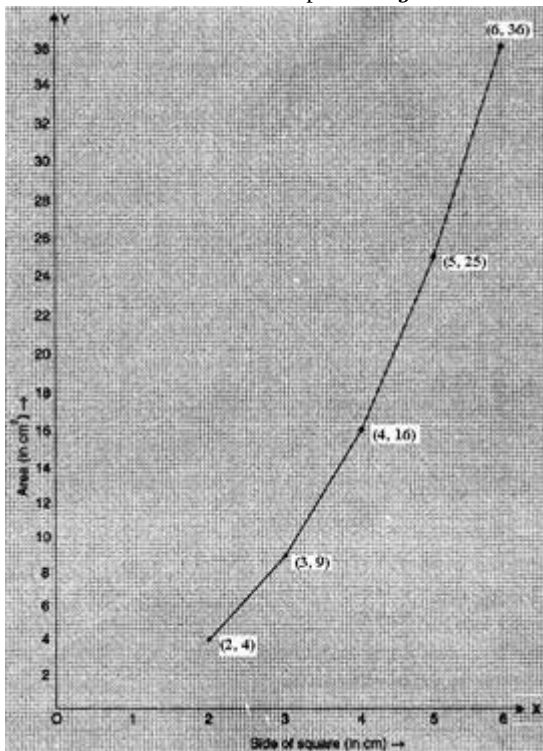
Given scale in the blue print is  $1 \text{ cm} = 2 \text{ m}$

$$\text{Length of room in the blue print} = \frac{18}{2} = 9 \text{ cm}$$

$$\text{Breadth of room in the blue print} = \frac{12}{2} = 6 \text{ cm}$$

$$\text{Area of the room in the blue print } \text{length} \times \text{breadth} = 9 \times 6 = 54 \text{ cm}^2 .$$

31.



i. Horizontal : 1 unit = 1 cm

Vertical : 1 unit = 2 cm

ii. Mark side of the square (in cm) on horizontal axis.

iii. Mark area (in  $\text{cm}^2$ ) on vertical axis.

iv. Plot the points (2, 4), (3, 9), (4, 16), (5, 25), (6, 36).

v. Join the points.

The graph we get is not line.