

RD SHARMA

Solutions

Class 6 Maths

Chapter 20

Ex 20.5

Mark the correct alternative in each of the following:

1. The sides of a rectangle are in the ratio 5 : 4. If its perimeter is 72 cm, then its length is

(a) 40 cm (b) 20 cm (c) 30 cm (d) 60 cm

Answer: (b) 20 cm

Explanation:

Let the sides of the rectangle be $5x$ and $4x$. (Since, they are in the ratio 5 : 4)

Now, perimeter of rectangle = $2(\text{Length} + \text{Breadth})$

$$72 = 2(5x + 4x)$$

$$72 = 2 \times 9x$$

$$72 = 18x$$

$$x = 4$$

Thus, the length of the rectangle = $5x = 5 \times 4 = 20$ cm

2. The cost of fencing a rectangular field 34 m long and 18 m wide at Rs 2.25 per metre is

(a) Rs 243 (b) Rs 234 (c) Rs 240 (d) Rs 334

Answer: (b) Rs. 234

Explanation:

For fencing the rectangular field, we need to find the perimeter of the rectangle.

Length of the rectangle = 34 m

Breadth of the rectangle = 18 m

Perimeter of the rectangle = $2(\text{Length} + \text{Breadth}) = 2(34 + 18) \text{ m} = 2 \times 52 \text{ m} = 104 \text{ m}$

Cost of fencing the field at the rate of Rs. 2.25 per meter = $\text{Rs. } 104 \times 2.25 = \text{Rs. } 234$

3. If the cost of fencing a rectangular field at Rs. 7.50 per metre is Rs. 600, and the length of the field is 24 m, then the breadth of the field is

(a) 8 m (b) 18 m (c) 24 m (d) 16 m

Answer: (d) 16 m

Explanation:

Cost of fencing the rectangular field = Rs. 600

Rate of fencing the field = Rs. 7.50 per m

Therefore, perimeter of the field = $\text{Cost of fencing} / \text{Rate of fencing} = 600 / 7.50 = 80 \text{ m}$

Now, length of the field = 24 m

Therefore, breadth of the field = $\text{Perimeter} / 2 - \text{Length} = 80 / 2 - 24 = 16 \text{ m}$

4. The cost of putting a fence around a square field at Rs 2.50 per metre is Rs 200. The length of each side of the field is

(a) 80 m (b) 40 m (c) 20 m (d) None of these

Answer: (c) 20 m

Explanation:

Cost of fencing the square field = Rs. 200

Rate of fencing the field = Rs. 2.50

Now, perimeter of the square field = $\text{Cost of fencing} / \text{Rate of fencing} = 200 / 2.50 = 80 \text{ m}$

Perimeter of square = $4 \times \text{Side of the square}$

Therefore, side of the square = $\text{Perimeter} / 4 = 80 / 4 = 20 \text{ m}$

5. The length of a rectangle is three times of its width. If the length of the diagonal is $8\sqrt{10}$ m, then the perimeter of the rectangle is

(a) $15\sqrt{10}$ m (b) $16\sqrt{10}$ m (c) $24\sqrt{10}$ m (d) 64 m

Answer: (d) 64 m

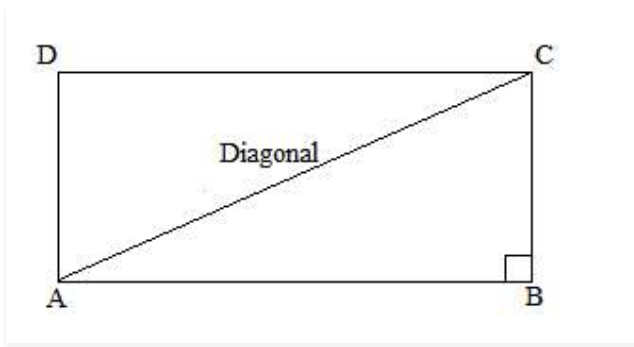
Explanation:

Let us consider a rectangle ABCD.

Also, let us assume that the width of the rectangle, i.e., BC be x m.

It is given that the length is three times width of the rectangle.

Therefore, length of the rectangle, i.e., AB = $3x$ m



Now, AC is the diagonal of rectangle.

In right angled triangle ABC.

$$AC^2 = AB^2 + BC^2$$

$$(8\sqrt{10})^2 = (3x)^2 + x^2$$

$$640 = 9x^2 + x^2$$

$$640 = 10x^2$$

$$x^2 = 640 / 10 = 64$$

$$x = \sqrt{64} = 8 \text{ m}$$

Thus, breadth of the rectangle = $x = 8 \text{ m}$

Similarly, length of the rectangle = $3x = 3 \times 8 = 24 \text{ m}$

Perimeter of the rectangle = $2 (\text{Length} + \text{Breadth})$

$$= 2 (24 + 8)$$

$$= 2 \times 32 = 64 \text{ m}$$

6. If a diagonal of a rectangle is thrice its smaller side, then its length and breadth are in the ratio

(a) 3 : 1 (b) $\sqrt{3} : 1$ (c) $\sqrt{2} : 1$ (d) $2\sqrt{2} : 1$

Answer: (d) 22 : 1

Explanation:

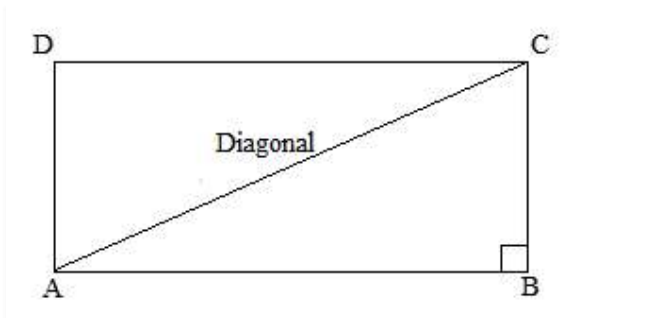
Let us assume that the length of the smaller side of the rectangle, i.e., BC be x and length of the larger side, i.e., AB be y .

It is given that the length of the diagonal is three times that of the smaller side.

Therefore, diagonal = $3x = AC$

Now, applying Pythagoras theorem, we get:

$$(\text{Diagonal})^2 = (\text{Smaller side})^2 + (\text{Larger side})^2$$



$$(AC)^2 = (AB)^2 + (BC)^2$$

$$(3x)^2 = (x)^2 + (y)^2$$

$$9x^2 = x^2 + y^2$$

$$8x^2 = y^2$$

Now, taking square roots of both sides, we get:

$$2\sqrt{2} x = y$$

$$\text{or, } y / x = 2\sqrt{2} / 1$$

Thus, the ratio of the larger side to the smaller side = $2\sqrt{2} : 1$

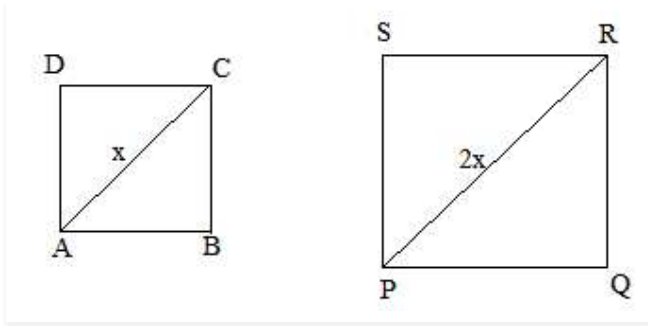
7. The ratio of the areas of two squares, one having its diagonal double than the other, is

(a) 1 : 2 (b) 2:3 (c) 3 : 1 (d) 4 : 1

Answer: (d) 4 : 1

Explanation:

Let the two squares be ABCD and PQRS. Further, the diagonal of square PQRS is twice the diagonal of square ABCD



$PR = 2 AC$

Now, area of the square = $\frac{(\text{diagonal})^2}{2}$

Area of PQRS = $\frac{(PR)^2}{2}$

Similarly, area of ABCD = $\frac{(AC)^2}{2}$

According to the question:

If $AC = x$ units, then, $PR = 2x$ units

Therefore, Area of PQRS / Area of ABCD = $\frac{\frac{(PR)^2}{2}}{\frac{(AC)^2}{2}} = \frac{(PR)^2}{(AC)^2} = \frac{(2x)^2}{(1x)^2} = \frac{4}{1} = 4 : 1$

Thus, the ratio of the areas of squares PQRS and ABCD = 4 : 1

8. If the ratio of areas of two squares is 225 : 256, then the ratio of their perimeters is

(a) 225 : 256 (b) 256 : 225 (c) 15:16 (d) 16 : 15

Answer: (c) 15 : 16

Explanation:

Let the two squares be ABCD and PQRS.

Further, let the lengths of each side of ABCD and PQRS be x and y , respectively.

Therefore Area of sq. ABCD / Area of sq. PQRS = x^2 / y^2

$\Rightarrow x^2 / y^2 = 225 / 256$

Taking square roots on both sides, we get:

$x / y = 15 / 16$

Now, the ratio of their perimeters:

Perimeter of sq. ABCD / Perimeter of sq. PQRS

$= 4 \times \text{side of sq. ABCD} / 4 \times \text{Side of sq. PQRS} = 4x / 4y$

Perimeter of sq. ABCD / Perimeter of sq. PQRS = x / y

Perimeter of sq. ABCD / Perimeter of sq. PQRS = $15 / 16$

Thus, the ratio of their perimeters = 15 : 16

9. If the sides of a square are halved, then its area

(a) remains same (b) becomes half (c) becomes one fourth

(d) becomes double

Answer: (c) becomes one fourth

Explanation:

Let the side of the square be x .

Then, area = (Side \times Side) = $(x \times x) = x^2$

If the sides are halved, new side = $x / 2$

$$\text{Now, new area} = \left(\frac{x}{2}\right)^2$$

$$= \frac{x^2}{4}$$

It is clearly visible that the area has become one-fourth of its previous value.

10. A rectangular carpet has area 120 m² and perimeter 46 metres. The length of its diagonal is

(a) 15 m (b) 16 m (c) 17 m (d) 20 m

Answer: (c) 17 m

Explanation:

$$\text{Area of the rectangle} = 120 \text{ m}^2$$

$$\text{Perimeter} = 46 \text{ m}$$

Let the sides of the rectangle be l and b.

Therefore

$$\text{Area} = lb = 120 \text{ m}^2 \dots (1)$$

$$\text{Perimeter} = 2(l + b) = 46$$

$$\text{Or, } (l + b) = 46 / 2 = 23 \text{ m} \dots (2)$$

$$\text{Now, length of the diagonal of the rectangle} = l^2 + b^2$$

So, we first find the value of $(l^2 + b^2)$

Using identity:

$$(l^2 + b^2) = (l + b)^2 - 2(lb) \text{ [From (1) and (2)]}$$

Therefore

$$(l^2 + b^2) = (23)^2 - 2(120)$$

$$= 529 - 240 = 289$$

$$\text{Thus, length of the diagonal of the rectangle} = l^2 + b^2 = 289 = 17 \text{ m}$$

11. If the ratio between the length and the perimeter of a rectangular plot is 1 : 3, then the ratio between the length and breadth of the plot is

(a) 1 : 2 (b) 2 : 1 (c) 3 : 2 (d) 2 : 3

Answer: (b) 2 : 1

Explanation:

It is given that Length of rectangle / Perimeter of rectangle = 1 / 3

$$\Rightarrow 1 / (2l + 2b) = 1 / 3$$

After cross multiplying, we get:

$$3l = 2l + 2b$$

$$\Rightarrow l = 2b$$

$$\Rightarrow l / b = 2 / 1$$

Thus, the ratio of the length and the breadth is 2 : 1.

12. If the length of the diagonal of a square is 20 cm, then its perimeter is

(a) $10\sqrt{2}$ cm (b) 40 cm (c) $40\sqrt{2}$ cm (d) 200 cm

Answer: (c) $40\sqrt{2}$ cm

Explanation:

Length of diagonal = 20 cm

$$\text{Length of side of a square} = \frac{\text{Length of diagonal}}{\sqrt{2}}$$

$$= \frac{20}{\sqrt{2}}$$

$$= 10\sqrt{2}$$

Therefore, perimeter of the square is $4 \times \text{Side} = 4 \times 10\sqrt{2}$ cm

$$= 40\sqrt{2} \text{ cm}$$