Exercise 20G

Q1

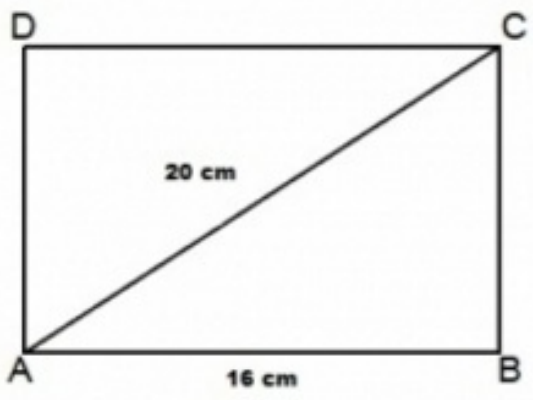
Answer :

(c) 192 cm^2

Let ABCD be the rectangular plot.

Then, AB = 16 cm

AC = 20 cm



Let BC = x cm

From right triangle ABC:

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

$\Rightarrow (20)^2 = (16)^2 + x^2$

$\Rightarrow x^2 = (20)^2 - (16)^2 \Rightarrow \{400 - 256\} = 144$

$\Rightarrow x = \sqrt{144} = 12$

$\therefore$ BC = 12 cm

$\therefore$ Area of the plot = $(16 \times 12)\ cm^2 = 192\ cm^2$

Q2

Answer :

(b) 72 cm^2

Given:

Diagonal of the square = 12 cm

$\therefore$ Area of the square = $\left\{\frac{1}{2} \times (\textbf{Diagonal})^2\right\}$ sq. units.

$= \left\{\frac{1}{2} \times (12)^2\right\}$ cm^2

= 72 cm^2

Q3

Answer :

(b) 20 cm

Area of the square = $\left\{\frac{1}{2} \times (\textbf{\textit{D}iagonal})^2\right\}$ sq. units.

Area of the square field = 200 cm^2

Diagonal of a square = $\sqrt{2 \times \textbf{Area of the square}}$

$= \left(\sqrt{2 \times 200}\right)$ cm = $\left(\sqrt{400}\right)$ cm = 20 cm

$\therefore$ Length of the diagonal of the square = 20 cm

Q4

Answer :

(a) 100 m

Area of the square = $\left\{\frac{1}{2} \times (\textbf{\textit{D}iagonal})^2\right\}$ sq. units.

Given:

Area of square field = 0.5 hectare

$= (0.5 \times 10000)$m^2 [since 1 hectare = 10000 m^2]

= 5000 m^2

Diagonal of a square = $\sqrt{2 \times \textbf{Area of the square}}$

$= \left(\sqrt{2 \times 5000}\right)$m = 100 m

Hence, the length of the diagonal of a square field is 100 m.

Q5

Answer :

(c) 90 m

Let the breadth of the rectangular field be x m.
Length = $3x$ m
Perimeter of the rectangular field = $2(l + b)$
$\Rightarrow 240 = 2(x + 3x)$
$\Rightarrow 240 = 2(4x)$
$\Rightarrow 240 = 8x \quad \Rightarrow x = \left(\frac{240}{8}\right) = 30$
$\therefore$ Length of the field = $3x = (3 \times 30)$ m = 90 m

Q6

Answer :

(d) 56.25%

Let the side of the square be a cm.
Area of the square = $(a)^2$ cm^2
Increased side = (a + 25% of a) cm

$$= \left(a + \frac{25}{100}a\right) \text{ cm} = \left(a + \frac{1}{4}a\right)\text{cm} = \left(\frac{5}{4}a\right) \text{ cm}$$

Area of the square = $\left(\frac{5}{4}a\right)^2 \text{cm}^2 = \left(\frac{25}{16}a^2\right)$ cm^2

Increase in the area = $\left[\left(\frac{25}{16}a^2\right) - a^2\right]$ cm^2 = $\left(\frac{25a^2 - 16a^2}{16}\right)$ cm^2 = $\left(\frac{9a^2}{16}\right)$ cm^2

% increase in the area = $\frac{\text{Increased area}}{\text{Old area}} \times 100$

$$= \left[\frac{\left(\frac{9}{16}a^2\right)}{a^2} \times 100\right] = \left(\frac{9 \times 100}{16}\right) = 56.25$$

Q7

Answer :

(b) 1:2

Let the side of the square be a.
Length of its diagonal = $\sqrt{2}a$

$$\therefore \text{Required ratio} = \frac{a^2}{\left(\sqrt{2}a\right)^2} = \frac{a^2}{2a^2} = \frac{1}{2} = 1:2$$

Q8

Answer :

(c) $A > B$

********** END **********