



#### Exercise 10D

Question 50:

Let the shorter side of triangle be  $x$  meter

Then, its hypotenuse =  $(2x - 1)$  meter

And let the altitude =  $(x + 1)$  meter

$$\text{Then, } (2x - 1)^2 = x^2 + (x + 1)^2$$

$$\Rightarrow 4x^2 + 1 - 4x = x^2 + x^2 + 1 + 2x$$

$$\Rightarrow 2x^2 - 6x = 0$$

$$\Rightarrow 2x(x - 3) = 0$$

$$\Rightarrow (x - 3) = 0 \text{ or } 2x = 0$$

$$x = 3 \text{ or } x = 0$$

$$x = 3 \text{ [}\because \text{Base cannot be zero]}$$

thus, Base = 3m

hypotenuse =  $(2 \times 3 - 1) \text{ m} = 5 \text{ m}$

Altitude =  $(3 + 1) \text{ m} = 4 \text{ m}$

Question 51:

Let  $x$  and  $y$  be the lengths of the two square fields.

$$\therefore x^2 + y^2 = 640 \text{ -----(1)}$$

$$4x - 4y = 64$$

$$x - y = 16 \text{ -----(2)}$$

From (2),

$$x = y + 16,$$

Putting value of  $x$  in (1)

$$(y+16)^2 + y^2 = 640$$

$$\text{or } y^2 + 32y + 256 + y^2 = 640$$

$$\Rightarrow 2y^2 + 32y + 256 - 640 = 0$$

$$\Rightarrow 2y^2 + 32y - 384 = 0$$

$$\text{or } y^2 + 16y - 192 = 0$$

$$\text{or } y^2 + 24y - 8y - 192 = 0$$

$$\Rightarrow y(y+24) - 8(y+24) = 0 \quad \text{or} \quad (y+24)(y-8) = 0$$

$$\therefore y+24 = 0 \quad \text{or} \quad y = -24$$

$$\therefore y-8 = 0 \quad \text{or} \quad y = 8$$

Putting  $y = 8$  in (2)

$$x-8 = 16 \quad \therefore x = 16 + 8 = 24$$

Sides of two squares are 24m and 8m respectively.

Question 52:

Let the two numbers be  $x$  and  $y$

Difference of the squares of the numbers

$$x^2 - y^2 = 88 \quad \text{---(1)}$$

$$\text{also, } x = 2y - 5 \quad \text{---(2)}$$

Putting value of  $x$  in (1)

$$(2y-5)^2 - y^2 = 88$$

$$\Rightarrow 4y^2 - 20y + 25 - y^2 = 88 \quad \text{or} \quad 3y^2 - 20y - 63 = 0$$

$$\Rightarrow 3y^2 - 27y + 7y - 63 = 0 \quad \text{or} \quad 3y(y-9) + 7(y-9) = 0$$

$$\Rightarrow (y-9)(3y+7) = 0 \Rightarrow y = 9 \quad \text{or} \quad \frac{-7}{3}$$

$$\text{But } y \neq \frac{-7}{3} \quad \therefore y = 9$$

$$\therefore \text{from (1), } x = 2 \times 9 - 5 = 18 - 5 = 13$$

So the required numbers are 13 and 9.

Question 53:

Let the three consecutive numbers be  $x, x+1, x+2$

Sum of square of first and product of the other two

$$= x^2 + (x+1)(x+2) = 46$$

$$\Rightarrow x^2 + (x^2 + 3x + 2) = 46 \quad \text{or} \quad 2x^2 + 3x - 44 = 0$$

$$\Rightarrow 2x^2 + 11x - 8x - 44 = 0 \quad \text{or} \quad x(2x+11) - 4(2x+11) = 0$$

$$\Rightarrow (x-4)(2x+11) = 0 \quad \therefore x = 4 \quad \text{or} \quad \frac{-11}{2}$$

$$\text{But } x \neq \frac{-11}{2} \quad \therefore x = 4$$

$\therefore$  Required numbers are 4, 5 and 6

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\*\*\*\*\* END \*\*\*\*\*

