

Ex-12

3. And two no.s whose sum is 27 & product is 142

let first no be  $x$

" second no. be  $27-x$

$$\text{Product} = 142$$

$$\Rightarrow x(27-x) = 142$$

$$\Rightarrow 27x - x^2 = 142 \Rightarrow x^2 - 27x + 142 = 0$$

$$\Rightarrow x^2 - 13x - 14x + 142 = 0$$

$$\Rightarrow x(x-13) - 14(x-13) = 0$$

$$\Rightarrow (x-13)(x-14) = 0$$

$$\Rightarrow x = 13, x = 14$$

For  $x = 13$

first no.  $x = 13$

second no.  $27-x$

$$= 27 - 13 = 14$$

For  $x = 14$

first no.  $14$

second no.  $27-x$

$$= 27 - 14 = 13$$

4. let first integer  $x$

" second "  $x+1$

Sum of squares = 365

$$x^2 + (x+1)^2 = 365$$

$$\Rightarrow x^2 + x^2 + 1 + 2x = 365 \Rightarrow 2x^2 + 1 + 2x = 365$$

$$\Rightarrow 2x^2 + 2x + 1 - 365 = 0 \Rightarrow 2(x^2 + x - 182) = 0$$

$$\Rightarrow x^2 + x - 182 = 0$$

$$\Rightarrow x^2 + x - 182 = 0$$

$$\Rightarrow x^2 + 14x - 13x - 182 = 0$$

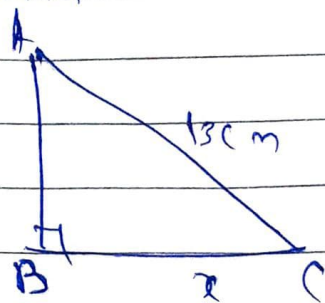
$$\Rightarrow x(x+14) - 13(x+14) = 0 \Rightarrow (x+14)(x-13) = 0$$

$$x = -14 \quad \& \quad x = 13$$

first integer  $x = 13$

$$\text{second " } = x+1 = 13+1 = 14$$

5. Altitude =  $AB = x - 7$  | Hypotenuse =  $13 \text{ cm}$   
 Base =  $x \text{ cm}$



Hypotenuse<sup>2</sup> = Height<sup>2</sup> + Base<sup>2</sup>

$$\Rightarrow (13)^2 = (x-7)^2 + x^2$$

$$\Rightarrow 13 \times 13 = x^2 + 7^2 - 2(x)(7) + x^2$$

$$\Rightarrow 169 = x^2 + 49 - 14x + x^2$$

$$\Rightarrow 169 = 2x^2 - 14x + 49$$

$$\Rightarrow 0 = 2x^2 - 14x + 49 - 169 \Rightarrow 0 = 2x^2 - 14x - 120$$

$$\Rightarrow 2x^2 - 14x - 120 = 0$$

$$\Rightarrow 2(x^2 - 7x - 60) = 0$$

$$\Rightarrow x^2 - 7x - 60 = \frac{0}{2}$$

$$\Rightarrow x^2 - 7x - 60 = 0$$

$$\Rightarrow x^2 - 5x - 12x - 60 = 0 \Rightarrow x(x+5) - 12(x+5) = 0$$

$$\Rightarrow (x-12)(x+5) = 0$$

$$x = 12, \quad x = -5$$

$$\text{Base} = x = 12$$

$$\text{Altitude} = x - 7 \Rightarrow 12 - 7 = 5 \text{ cm}$$

6. No. of articles =  $x$

Cost of 1 article =  $2x + 3$

Total cost of production = ₹ 90

$$\Rightarrow x(2x+3) = 90$$

$$\Rightarrow 2x^2 + 3x - 90 = 0$$

$$\Rightarrow 2x^2 + 15x - 12x - 90 = 0$$

$$\Rightarrow x(2x+15) - 6(2x+15) = 0$$

$$\Rightarrow (x-6)(2x+15) = 0$$

$$\Rightarrow (x-6)(2x+15) = 0$$

$$x = 6, \quad x = \frac{-15}{2}$$

$$\text{Cost of articles} = 2x + 3 = 15$$