

Exercise 4.9

Present age of Ashu = x

Present age of his mother = x^2

ATQ,

$$x^2 + 5 = 3(x + 5)$$

$$x^2 + 5 = 3x + 15$$

$$x^2 - 3x + 5 - 15 = 0$$

$$x^2 - 3x - 10 = 0$$

$$x^2 - 5x + 2x - 10 = 0$$

$$x(x - 5) + 2(x - 5) = 0$$

$$(x - 5)(x + 2) = 0$$

$$x - 5 = 0$$

$$\boxed{x = 5}$$

$$x + 2 = 0$$

$$\boxed{x = -2}$$

(Neglected)

$\therefore$ Present age of Ashu = $\boxed{5 \text{ years}}$

Present age of his mother = $5^2 = \boxed{25 \text{ years}}$

Let the present age of the man be x

Age of his son = $45 - x$

Sum of ages of man & son = 45

ATQ

~~$$(x - 5)(45 - x - 5) = 4(x - 5)$$~~

~~$$(x - 5)(40 - x) = 4x - 20$$~~

~~$$40x - x^2 - 200 + 5x = 4x - 20$$~~

$$(x-5)(45-x-5) = 4(x-5)$$

$$\cancel{(x-5)}(40-x) = 4\cancel{(x-5)}$$

$$40-x = 4$$

$$40-4 = x$$

$$\boxed{x = 36}$$

$$\therefore \text{Age of man} = \boxed{36 \text{ years}}$$

$$\begin{aligned} \text{Age of his son} &= 45 - 36 \\ &= \boxed{9 \text{ years}} \end{aligned}$$

Q.3 Let the present age of Shikha be x .

ATQ,

$$(x-5)(x+8) = 30$$

$$x^2 + 8x - 5x - 40 = 30$$

$$x^2 + 3x - 40 - 30 = 0$$

$$x^2 + 3x - 70 = 0$$

$$x^2 + 10x - 7x - 70 = 0$$

$$x(x+10) - 7(x+10) = 0$$

$$(x+10)(x-7) = 0$$

$$x+10 = 0$$

$$\boxed{x = -10}$$

(Neglected)

$$x-7 = 0$$

$$\boxed{x = 7}$$

$$\therefore \text{Present age of Shikha} = \boxed{7 \text{ years}}$$

Q.6

Let the age of sister be x .

Age of girl = $2x$

ATQ,

$$(2x+4)(x+4) = 160$$

$$2x^2 + 8x + 4x + 16 = 160$$

$$2x^2 + 12x + 16 - 160 = 0$$

$$2x^2 + 12x - 144 = 0$$

$$x^2 + 6x - 72 = 0$$

$$x^2 + 12x - 6x - 72 = 0$$

$$x(x+12) - 6(x+12) = 0$$

$$(x+12)(x-6) = 0$$

$$(x+12) = 0$$

$$x = -12$$

(Neglected)

$$x - 6 = 0$$

$$x = 6$$

$$\therefore \text{Age of sister} = \boxed{6 \text{ years}}$$

$$\text{Age of girl} = 2(6) = \boxed{12 \text{ years}}$$

8 Let the actual age of Zeba be x .

ATQ,

$$(x-5)^2 = 5x+11$$

$$x^2 + 25 - 10x = 5x + 11$$

$$x^2 - 10x - 5x + 25 - 11 = 0$$

$$x^2 - 15x + 14 = 0$$

$$x^2 - 14x - x + 14 = 0$$

$$x(x-14) - 1(x-14) = 0$$

$$(x-14)(x-1) = 0$$

$$x - 14 = 0$$

$$x = 14$$

$$x - 1 = 0$$

$$x = 1$$

(Neglected)

$$\therefore \text{Actual age of Zeba} = \boxed{14 \text{ years}}$$

Q. 9

Let Nisha's present age be x .
 Asha's present age. = $x^2 + 2$

Age of Nisha when she turns her mother's age = $x^2 + 2$
 Age of Asha at that time = $10x - 1$

ATQ,

$$(x^2 + 2) - x = (10x - 1) - (x^2 + 2)$$

$$x^2 + 2 - x = 10x - 1 - x^2 - 2$$

$$x^2 + x^2 + 2 + 3 - x - 10x = 0$$

$$2x^2 - 11x + 5 = 0$$

$$2x^2 - 10x - x + 5 = 0$$

$$2x(x - 5) - 1(x - 5) = 0$$

$$(x - 5)(2x - 1) = 0$$

$$x - 5 = 0$$

$$\boxed{x = 5}$$

$$2x - 1 = 0$$

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

(Neglected)

∴ Present age of Nisha = $\boxed{5 \text{ years}}$

Present age of Asha = $(5)^2 + 2 = 25 + 2$
 $= \boxed{27 \text{ years}}$