

## Identities

### Solution

$$\begin{aligned} 5. \quad \text{L.H.S.} &= 7(B-x) \\ &= 7B - 7x \\ &= -7x + 7B \end{aligned}$$

$$\therefore -7x + 7B \equiv Ax + 14$$

Comparing like terms on both sides, we have

$$A = -7$$

$$7B = 14$$

$$\text{i.e. } B = 2$$

$$\begin{aligned} 6. \quad \text{L.H.S.} &= P(x+2) - 7 \\ &= Px + 2P - 7 \end{aligned}$$

$$\begin{aligned} \text{R.H.S.} &= 3(x-1) - Q \\ &= 3x - 3 - Q \end{aligned}$$

$$\therefore Px + 2P - 7 \equiv 3x - 3 - Q$$

Comparing like terms on both sides, we have

$$P = 3$$

$$2P - 7 = -3 - Q$$

$$\therefore 2(3) - 7 = -3 - Q$$

$$Q = -2$$

$$\begin{aligned} 7. \quad \text{L.H.S.} &= 2(x^2 - 4) + Ax \\ &= 2x^2 - 8 + Ax \\ &= 2x^2 + Ax - 8 \end{aligned}$$

$$\begin{aligned} \text{R.H.S.} &= (x+B)(Cx-8) \\ &= (x+B)(Cx) + (x+B)(-8) \\ &= Cx^2 + BCx - 8x - 8B \\ &= Cx^2 + (BC-8)x - 8B \end{aligned}$$

$$\therefore 2x^2 + Ax - 8 \equiv Cx^2 + (BC-8)x - 8B$$

Comparing like terms on both sides, we have

$$C = 2$$

$$8 = 8B$$

$$\therefore B = 1$$

$$\begin{aligned} A &= BC - 8 \\ &= (1)(2) - 8 \\ &= -6 \end{aligned}$$

$$8. \quad \text{Sub } x = -3 \text{ on both sides,}$$

$$\text{L.H.S.} = 0$$

$$\begin{aligned} \text{R.H.S.} &= (-3)^2 - 2(-3) - C \\ &= 9 + 6 - C \\ &= 15 - C \end{aligned}$$

$$\therefore C = 15$$

$$\text{Sub } x = -1 \text{ on both sides,}$$

$$\begin{aligned} \text{L.H.S.} &= A(-1-2)(-1+3) \\ &= -6A \end{aligned}$$

$$\begin{aligned} \text{R.H.S.} &= (-1)^2 - 2(-1) - 15 \\ &= 1 + 2 - 15 \\ &= -12 \end{aligned}$$

$$\therefore -6A = -12$$

$$A = 2$$

$$\text{Sub } x = 2 \text{ on both sides,}$$

$$\begin{aligned} \text{L.H.S.} &= B(2+1)(2+3) \\ &= 15B \end{aligned}$$

$$\begin{aligned} \text{R.H.S.} &= (2)^2 - 2(2) - 15 \\ &= 4 - 4 - 15 \\ &= -15 \end{aligned}$$

$$\therefore 15B = -15$$

$$B = -1$$