

# *Quadratic Identities*

If  $a_1x^2 + b_1x + c_1 = a_2x^2 + b_2x + c_2$   
for more than 2 values of  $x$ , then;

$$a_1 = a_2$$

$$b_1 = b_2$$

$$c_1 = c_2$$

e.g. Find  $A$ ,  $B$  and  $C$  if;

$$\begin{aligned} 2x^2 - 7x - 4 &\equiv A(x+2)^2 + B(x+2) + C \\ &= A(x^2 + 4x + 4) + B(x+2) + C \\ &= Ax^2 + 4Ax + 4A + Bx + 2B + C \\ &= Ax^2 + (4A + B)x + (4A + 2B + C) \end{aligned}$$

$$A = 2$$

$$4A + B = -7$$

$$4A + 2B + C = -4$$

$$8 + B = -7$$

$$8 - 30 + C = -4$$

$$B = -15$$

$$C = 18$$

$$\underline{\therefore A = 2, B = -15, C = 18}$$

**OR**

$$2x^2 - 7x - 4 \equiv A(x+2)^2 + B(x+2) + C$$

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

$$2(-2)^2 - 7(-2) - 4 = C$$

$$C = 18$$

$$\underline{x = 0}$$

$$-4 = 4A + 2B + C$$

$$4A + 2B = -22$$

$$2A + B = -11$$

$$\underline{x = 1}$$

$$2 - 7 - 4 = 9A + 3B + C$$

$$9A + 3B = -27$$

$$3A + B = -9$$

$$2A + B = -11 \quad (-)$$

$$\underline{3A + B = -9}$$

$$A = 2 \quad \therefore B = -15$$

$$\underline{\therefore A = 2, B = -15, C = 18}$$

**Exercise 8I; 1, 4, 5b, 8b, 9bc**