

SAMPLE PAPER 2014 (SET F): PAPER 1**QUESTION 4 (25 MARKS)****Question 4 (a)**

$x^2 - 6x - 23 = 0$ ← Write down the values of a , b and c .

$$a = 1, b = -6, c = -23$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(-23)}}{2(1)} \quad \leftarrow \text{Input into your calculator as shown.}$$

For \pm choose either $+$ or $-$ but put \pm back into the answer.

$$= \frac{6 \pm \sqrt{36 + 92}}{2}$$

$$= \frac{6 \pm \sqrt{128}}{2}$$

$$= \frac{6 \pm \sqrt{64 \times 2}}{2}$$

$$= \frac{6 \pm 8\sqrt{2}}{2}$$

$$= 3 \pm 4\sqrt{2}$$

FORMULAE AND TABLES BOOK
Algebra: Roots of the quadratic equation

$$ax^2 + bx + c = 0 \text{ [page 20]}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Question 4 (b)

$2r - s = 10 \Rightarrow 2r - 10 = s \dots \dots \text{(L)}$ ← Write the linear equation (L) in terms of s .

$$rs - s^2 = 12 \dots \dots \text{(Q)}$$

$r(2r - 10) - (2r - 10)^2 = 12$ ← Replace s in the quadratic equation (Q).

$$r(2r - 10) - (2r - 10)(2r - 10) = 12$$

$$2r^2 - 10r - [4r^2 - 20r - 20r + 100] = 12$$

$$2r^2 - 10r - [4r^2 - 40r + 100] - 12 = 0$$

$$2r^2 - 10r - 4r^2 + 40r - 100 - 12 = 0$$

$$-2r^2 + 30r - 112 = 0$$

$r^2 - 15r + 56 = 0$ ← Factorise the quadratic.

$$(r - 7)(r - 8) = 0$$

$$\therefore r = 7, 8$$

$r = 7 : s = 2(7) - 10 = 14 - 10 = 4$ ← Solve for s by substituting r into the linear equation (L).

$$r = 8 : s = 2(8) - 10 = 16 - 10 = 6$$

ANSWERS: $r = 7, s = 4$ and $r = 8, s = 6$.
