

FURTHER MATHS ENROLMENT WORK

EXTENSION QUESTIONS Solutions

1 a $2^{x-1} = 2^4$ ✓
 $x - 1 = 4$ ✓
 $x = 5$ ✓ (3)

b $3^y - 10 = 17$ ✓
 $3^y = 27$ ✓
 $y = 3$ ✓ (2)

2 a $=(x-3)^2 - 9 + 11$
 $=(x-3)^2 + 2$ AI for -3 AI for 2 (2)

b BI shape (3)

3 a $=(\frac{49}{4})^{\frac{1}{2}} = \sqrt{\frac{4}{49}} = \frac{2}{7}$ ✓ (2)

b $3x^{-3} = \frac{64}{9}$ ✓
 $x^3 = \frac{27}{64}$ ✓
 $x = \sqrt[3]{\frac{27}{64}} = \frac{3}{4}$ ✓ (3)

4 $2x\sqrt{3} + 9 = x\sqrt{3}$ ✓
 $x\sqrt{3} = -9$ ✓
 $x = \frac{-9}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = -3\sqrt{3}$ ✓ (4)

5 a $x = \frac{-10 \pm \sqrt{100 - 52}}{2}$ ✓
 $= \frac{-10 \pm \sqrt{48}}{2}$ ✓
 $= \frac{-10 \pm 4\sqrt{3}}{2}$ ✓
 $= -5 \pm 2\sqrt{3}$ ✓ (4)

6 a $42x - 49 = 9x^2$
 $9x^2 - 42x + 49 = 0$ ✓
 $(3x - 7)^2 = 0$ ✓ (3)
 $x = \frac{7}{3}$ ✓

b $2 + (y + 1) = 2y(y + 1)$ ✓
 $2y^2 + y - 3 = 0$ ✓
 $(2y + 3)(y - 1) = 0$ ✓
 $y = -\frac{3}{2}$ or 1 ✓ (4)

b
 $x < -5 - 2\sqrt{3}$ or $x > -5 + 2\sqrt{3}$ ✓ (2)

7 $y = x + 3$ ✓
sub. ✓
 $3x^2 - 2x(x + 3) + (x + 3)^2 - 17 = 0$ ✓
 $x^2 = 4$ ✓
 $x = \pm 2$ ✓ (6)
 $\therefore x = -2, y = 1$ or $x = 2, y = 5$ ✓

8 a $x^{\frac{1}{2}} = \sqrt[3]{64} = 4$ ✓
 $x = 4^2 = 16$ ✓ (2)