Solving Quadratic Equations (Factorising)
Exam Style Questions

1. Solve $(x + 2)(x - 1) = 0$

   $x = -2$

   $x = 1$

   .... (1 mark)

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2. Solve $(x - 2)(x - 6) = 0$

   $x = 2$

   $x = 6$

   .... (1 mark)

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3. Solve $(3x - 2)(2x - 1) = 0$

   $x = \frac{2}{3}$

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

   .... (1 mark)

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4. Solve $(x + 1)^2 = 0$

   $x = -1$

   .... (1 mark)

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5. Solve $x^2 - 7x + 12 = 0$

$(x-4)(x-3) = 0$

$x = 4$
$x = 3$

$x = 4$
.... $x = 3$ .... (2 marks)

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6. Solve $x^2 - 4x - 12 = 0$

$(x-6)(x+2) = 0$

$x = 6, \ x = -2$

$x = -2$
...... $x = 6$ .... (2 marks)

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7. Solve $x^2 + 10x + 21 = 0$

$(x+7)(x+3) = 0$

$x = -7, \ x = -3$

...... $x = -7, \ x = -3$ .... (2 marks)

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8. Solve $x^2 - 10x + 16 = 0$

$(x-8)(x-2) = 0$

$x = 8, \ x = 2$

$x = 8$
...... $x = 2$ .... (2 marks)

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9. Solve $x^2 - 2x - 24 = 0$

$(x-6)(x+4) = 0$

$x = 6, \ x = -4$

$x = 6$
$x = -4$
………………………….. (2 marks)

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10. Solve $x^2 - 5x + 6 = 0$

$(x-3)(x-2) = 0$

$x = 3, \ x = 2$

$x = 3$
$x = 2$
………………………….. (2 marks)

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11. Solve $x^2 - 5x - 24 = 0$

$(x-8)(x+3) = 0$

$x = 8, \ x = -3$

$x = 8$
$x = -3$
………………………….. (2 marks)

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12. Solve $x^2 - 9 = 0$

$(x+3)(x-3) = 0$

$x = -3, \ x = 3$

$x = -3, \ x = 3$
………………………….. (2 marks)

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13. Solve $x^2 - 16 = 0$

$(x+4)(x-4) = 0$

$x = -4, \; x = 4$

$x = -4$

$x = 4$

.... (2 marks)

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14. Solve $x^2 - 10x + 25 = 0$

$(x-5)^2 = 0$

$x = 5$

$x = 5$

.... (2 marks)

_____

15. Solve $3x^2 - 6x = 0$

$3x(x-2) = 0$

$x = 2$

$x = 0$

$x = 2$

$x = 0$

.... (2 marks)

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16. Solve $9x^2 + 12x = 0$

$3x(3x+4) = 0$

$x = 0$

$x = -\dfrac{4}{3}$

$x = 0$

$x = \dfrac{-4}{3}$

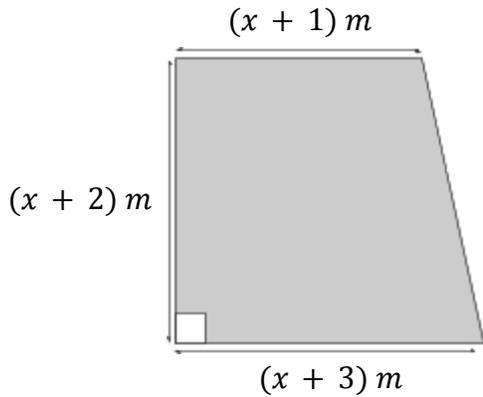.................................... (2 marks)

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17. Sam is putting a skirting board around his room.

His room is the shape of a trapezium, and has an area of $16\ m^2$.
A pack containing $2.2\ m$ of skirting board costs £13.
How much is it going to cost Sam to cover his toom?
Give your answer to the nearest pound.

$(x + 1)\ m$

$(x + 2)\ m$

$(x + 3)\ m$

$3m$

(using pythagoras)

$\sqrt{4^2 + 2^2}$

$4m$ $4m$ $= \sqrt{20}\ m$

$2m$

$5m$

$P = \left(3 + 4 + 5 + \sqrt{20}\right) m$

$= 16.472\ m$

$A = \frac{1}{2}(a+b)h$

$\Rightarrow 16 = \frac{1}{2}\left(x+1+x+3\right)(x+2)$

$\Rightarrow 16 = \frac{1}{2}(2x+4)(x+2)$

$16 = (x+2)(x+2)$

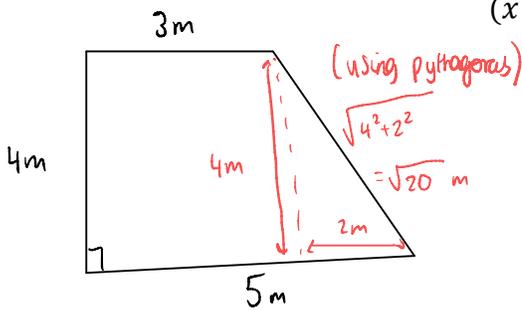$16 = x^2 + 2x + 2x + 4$

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

$x^2 + 4x - 12 = 0$

$(x+6)(x-2) = 0$

$x = 2,\ x = -6$

$x \neq -6$ since length

$\Rightarrow x = 2$

$16.472 \div 2.2 = 7.487$

So 8 packs needed.

$8 \times 13 = £104$

£...104.......................... (5 marks)

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HIGHER LEVEL

18. Solve $3x^2 + 10x + 3 = 0$

$3x^2 + 9x + x + 3 = 0$

$3x(x+3) + 1(x+3) = 0$

$(3x+1)(x+3) = 0$

$x = -3$

$x = -\frac{1}{3}$

$3 \times 3 = 9$

$9 \times 1 = 9$

$9 + 1 = 10$

$x = -3$

$x = -\frac{1}{3}$

.... (3 marks)

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HIGHER LEVEL

19. Solve $2x^2 + 3x + 1 = 0$

$2x^2 + 2x + x + 1 = 0$

$2x(x+1) + 1(x+1) = 0$

$(2x+1)(x+1) = 0$

$x = -1$

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

$2 \times 1 = 2$

$2 \times 1 = 2$

$2 + 1 = 3$

$x = -1 \quad x = \frac{-1}{2}$ .... (3 marks)

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HIGHER LEVEL

20. Solve $6x^2 + 7x + 2 = 0$

$6x^2 + 4x + 3x + 2 = 0$

$2x(3x+2) + 1(3x+2) = 0$

$(2x+1)(3x+2) = 0$

$x = -\frac{1}{2}, \ x = \frac{-2}{3}$

$6 \times 2 = 12$

$4 \times 3 = 12$

$4 + 3 = 7$

$x = -\frac{1}{2} \quad x = \frac{-2}{3}$ .... (3 marks)

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HIGHER LEVEL

21. Solve $4x^2 - 9 = 0$

$(2x+3)(2x-3) = 0$

$x = \frac{-3}{2}, \ x = \frac{3}{2}$

$x = \frac{-3}{2} \quad x = \frac{3}{2}$ .... (2 marks)

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HIGHER LEVEL

22. Solve $16x^2 - 100 = 0$

$4(4x^2 - 25) = 0$

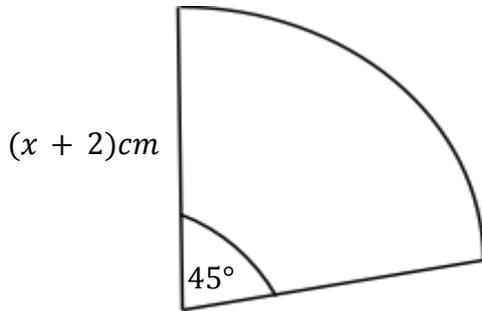$4(2x+5)(2x-5) = 0$

$x = -\frac{5}{2}, \ x = \frac{5}{2}$

$x = -\frac{5}{2}$

$x = \frac{5}{2}$ .... (2 marks)

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HIGHER LEVEL

23. The area of the below sector is $6.125\pi\ cm^2$. Find the arc length.

$(x + 2)cm$

$45°$

$A = \pi r^2 \times \dfrac{\theta}{360}$

$\Rightarrow 6.125\pi = \pi (x+2)^2 \times \dfrac{45}{360}$

$\Rightarrow 6.125 = \dfrac{1}{8}(x+2)^2$

$\Rightarrow 49 = (x+2)(x+2)$

$\Rightarrow x^2 + 4x + 4 = 49$

$\Rightarrow x^2 + 4x - 45 = 0$

$\Rightarrow (x+9)(x-5) = 0$

$\qquad x = -9, x = 5$

$\qquad\qquad x \neq -9\ (\text{since length})$

$\Rightarrow x = 5$

Arc length $= \pi D \times \dfrac{\theta}{360}$

$= \pi \times 14 \times \dfrac{45}{360}$

$= \dfrac{14}{8}\pi = \dfrac{7}{4}\pi$

$\dfrac{7\pi}{4}\ cm$

.... (5 marks)