Name:

Level 2 Further Maths

Solving Quadratics by Factorising

Corbettmaths

Ensure you have: Pencil or pen

Answers

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

www.corbettmaths.com/more/further-maths/

1. Solve $2x^2 + 5x + 2 = 0$

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

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

.....

(2)

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

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

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

.....

(2)

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

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

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

.....

(2)

4. Solve $7x^2 - 22x + 16 = 0$

$(7x - 8)(x - 2) = 0$

$x = \frac{8}{7}$ or $x = 2$

.....

(2)

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5. Solve $2x^2 + 15x - 38 = 0$

$(x - 2)(2x + 19) = 0$

$x = 2$ or $x = -\frac{19}{2}$

.....

(2)

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6. Solve $4x^2 + 12x - 7 = 0$

$(2x - 1)(2x + 7) = 0$

$x = \frac{1}{2}$ or $x = -\frac{7}{2}$

.....

(3)

7. Solve $6x^2 + 31x + 5 = 0$

$(6x + 1)(x + 5) = 0$

$x = -\frac{1}{6}$ or $x = -5$

.....

(3)

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8. Solve $4x^2 - 4x - 35 = 0$

$(2x + 5)(2x - 7) = 0$

$x = -\frac{5}{2}$ or $x = \frac{7}{2}$

.....

(3)

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9. Solve $12x^2 + 25x + 12 = 0$

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

$x = -\frac{4}{3}$ or $x = -\frac{3}{4}$

.....

(3)

10. Solve $16x^2 - 30x + 9 = 0$

$(8x - 3)(2x - 3) = 0$

$x = \frac{3}{8}$ or $x = \frac{3}{2}$

.....

(3)

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11. Solve $100x^2 - 169 = 0$

$(10x - 13)(10x + 13) = 0$

$x = \frac{13}{10}$ or $x = -\frac{13}{10}$

.....

(2)

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12. Solve $6y^2 + 4 = 13 - 3y + 4y^2$

$2y^2 + 3y - 9 = 0$

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

$y = -3$ or $y = \frac{3}{2}$

.....

(3)

13. Solve $3(x+1) = 3x^2 + x + 2$

$0 = 3x^2 - 2x - 1$

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

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

.....

(3)

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14. Solve $\dfrac{(4x+3)(x+2)}{x+1} = 3$

$(4x+3)(x+2) = 3(x+1)$

$4x^2 + 11x + 6 = 3x + 3$

$4x^2 + 8x + 3 = 0$

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

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

.....

(2)

15. Solve $\frac{2}{x^2} + \frac{13}{x} + 6 = 0$

$2 + 13x + 6x^2 = 0$

$6x^2 + 13x + 2 = 0$

$(x + 2)(6x + 1) = 0$

$x = -2$ or $x = -\frac{1}{6}$

.....

(4)

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16. Solve $\frac{2x - 1}{4} = \frac{1}{2x - 1}$

$(2x - 1)(2x - 1) = 4$

$4x^2 - 4x + 1 = 4$

$4x^2 - 4x - 3 = 0$

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

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

.....

(4)

17. Solve $\frac{3}{x^2} - \frac{5}{x} - 12 = 0$

$3 - 5x - 12x^2 = 0$

$12x^2 + 5x - 3 = 0$

$(3x - 1)(4x + 3) = 0$

$x = \frac{1}{3}$ or $x = -\frac{3}{4}$

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(4)

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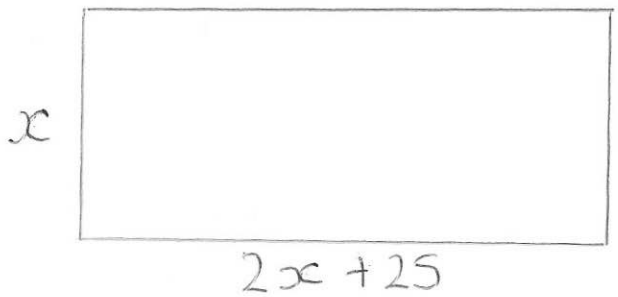
18. A rectangular field has a width of x metres.
The length of the field is 25 metres greater than twice the width of the field.
The area of the field is 450m²

Work out the length of the field.



$x(2x + 25) = 450$

$2x^2 + 25x - 450 = 0$

$(x - 10)(2x + 45) = 0$

$x = 10$ or $x = -\frac{45}{2}$

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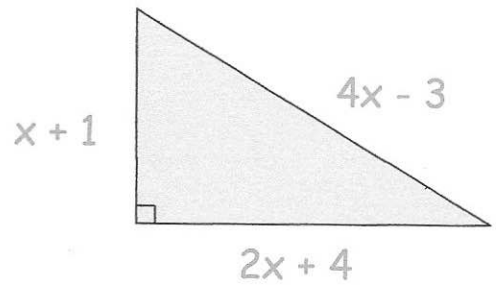
(4)

19. Shown is a right angled triangle.



(a) Show that $11x^2 - 42x - 8 = 0$

$(x+1)^2 + (2x+4)^2 = (4x-3)^2$

$x^2 + 2x + 1 + 4x^2 + 16x + 16 = 16x^2 - 24x + 9$

$5x^2 + 18x + 17 = 16x^2 - 24x + 9$

$0 = 11x^2 - 42x - 8$

.....

(3)

(b) Find the value of x

$11x^2 - 42x - 8 = 0$

$(x - 4)(11x + 2) = 0$

$x = 4$ ✓ or $x = -\frac{2}{11}$ ✗

4

.....

(2)

20. Solve the equation $7x - 22x^{\frac{1}{2}} + 16 = 0$

Let $x = y^2$

$7y^2 - 22y + 16 = 0$

$(7y - 8)(y - 2) = 0$

$y = \frac{8}{7}$ or $y = 2$

$x = \frac{64}{49}$ or $x = 4$

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(4)

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21. Solve the equation $4x^4 - 11x^2 + 6 = 0$

Let $y = x^2$

$4y^2 - 11y + 6 = 0$

$(y - 2)(4y - 3) = 0$

$y = 2$ or $y = \frac{3}{4}$

$x = \pm\sqrt{2}$ or $x = \pm\frac{\sqrt{3}}{2}$

.....

(4)

22. Solve $8^{x^2+4x+3} = 16^{x^2+5x+6}$

$(2^3)^{x^2+4x+3} = (2^4)^{x^2+5x+6}$

$2^{3x^2+12x+9} = 2^{4x^2+20x+24}$

$3x^2+12x+9 = 4x^2+20x+24$

$0 = x^2+8x+15$

$0 = (x+3)(x+5)$

$x = -3$ or $x = -5$

.....

(6)