

Name: _____

Exam Style Questions

Solving Quadratics by Factorising



Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

www.corbettmaths.com/contents

Video 266



1. Solve $x^2 + 5x + 6 = 0$

$$(x+2)(x+3) = 0$$
$$x = -2 \text{ or } x = -3$$

.....
(2)

2. Solve $x^2 + 9x + 14 = 0$

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

$$x = -2 \text{ or } x = -7$$

.....
(2)

3. Solve $x^2 + 21x + 20 = 0$

$$(x+20)(x+1) = 0$$
$$x = -20 \text{ or } x = -1$$

.....
(2)

4. Solve $x^2 - 3x - 18 = 0$

$$(x+3)(x-6)$$
$$x = -3 \text{ or } x = 6$$

.....
(2)

5. Solve $x^2 - 49 = 0$

$$(x - 7)(x + 7) = 0$$
$$x = 7 \text{ or } x = -7$$

.....
(2)

6. Solve $x^2 - 2x - 8 = 0$

$$(x - 4)(x + 2) = 0$$
$$x = 4 \text{ or } x = -2$$

.....
(2)

7. Solve $x^2 + 10x - 24 = 0$

$$(x + 12)(x - 2) = 0$$
$$x = -12 \text{ or } x = 2$$

.....
(2)

8. Solve $x^2 - 13x + 30 = 0$

$$(x - 3)(x - 10) = 0$$
$$x = 3 \text{ or } x = 10$$

.....
(2)

9. Solve $y^2 + 4y - 12 = 0$

$$(y + 6)(y - 2) = 0$$
$$y = -6 \text{ or } y = 2$$

(2)

10. Solve $m^2 + 24m + 63 = 0$

$$(m + 21)(m + 3) = 0$$
$$m = -21 \text{ or } m = -3$$

(2)

11. Solve $m^2 - 16m + 64 = 0$

$$(m - 8)(m - 8) = 0$$
$$m = 8$$

(2)

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

$$(2x + 1)(x + 2) = 0$$
$$2x + 1 = 0 \text{ or } x = -2$$
$$2x = -1$$
$$x = -\frac{1}{2} \text{ (or } -0.5)$$

(2)

13. Solve $5x^2 + 19x - 4 = 0$

$$(5x - 1)(x + 4) = 0$$

$$5x - 1 = 0 \text{ or } \underline{x = -4}$$

$$5x = 1$$

$$\underline{x = \frac{1}{5}} \text{ (or } 0.2)$$

(2)

14. Solve $2x^2 - 11x + 15 = 0$

$$(2x - 5)(x - 3) = 0$$

$$2x - 5 = 0 \text{ or } \underline{x = 3}$$

$$2x = 5$$

$$\underline{x = \frac{5}{2}} \text{ (or } 2.5)$$

(2)

15. Solve $y^2 - 6y = 27$

$$y^2 - 6y - 27 = 0$$

$$(y - 9)(y + 3) = 0$$

$$y = 9 \text{ or } y = -3$$

(2)

16. Solve $w^2 + 2w = 8$

$$w^2 + 2w - 8 = 0$$

$$(w + 4)(w - 2) = 0$$

$$w = -4 \text{ or } w = 2$$

(2)

17. Solve $x^2 = 8x - 15$

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

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

$$x = 5 \text{ or } x = 3$$

(2)

18. Solve $x^2 + 70 = 17x$

$$x^2 - 17x + 70 = 0$$

$$(x - 10)(x - 7) = 0$$

$$x = 10 \text{ or } x = 7$$

(2)

19. Solve $y^2 + 9y + 2 = 8y + 58$

$$y^2 + y - 56 = 0$$

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

$$y = -8 \text{ or } y = 7$$

(2)

20. Solve $5y^2 + 8y - 100 = y^2 + 4y - 37$

$$4y^2 + 4y - 63 = 0$$

$$(2y + 9)(2y - 7) = 0$$

$$2y + 9 = 0 \text{ or } 2y - 7 = 0$$

$$2y = -9 \quad 2y = 7$$

$$y = -\frac{9}{2} \quad y = \frac{7}{2}$$

$$\underline{\quad\quad\quad} \quad \underline{\quad\quad\quad}$$

$$(-4.5) \quad (3.5)$$

(2)

21. Victor is y years old.

His brother Fred is four years old than Victor.

$$y+4$$

The product of their ages is 780.

- (a) Set up an equation to represent this information.

$$y(y+4) = 780$$

$$y^2 + 4y = 780$$

$$y^2 + 4y - 780 = 0$$

.....
(2)

- (b) Solve your equation from (a) to find Victor's age.

$$(y+30)(y-26) = 0$$

$$y = -30 \quad \text{or} \quad y = 26$$

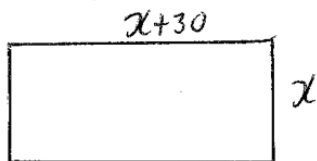
.....
26

(2)

22. A rectangular field is 30m longer than wide.

The area of the field is 8800m²

Work out the perimeter of the field.



$$\text{Perimeter} = 4x + 60$$

$$4 \times 80 + 60$$

$$= 380\text{m}$$

$$x^2 + 30x = 8800$$

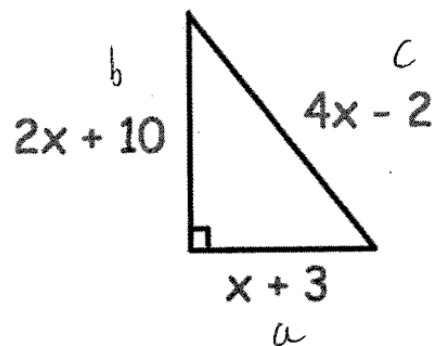
$$x^2 + 30x - 8800 = 0$$

$$(x+110)(x-80) = 0$$

$$x = -110 \quad x = 80$$

.....m
(4)

23.



Shown is a right angled triangle.

Show that $11x^2 - 62x - 105 = 0$

$$a^2 + b^2 = c^2$$

$$(x+3)^2 + (2x+10)^2 = (4x-2)^2$$

$$x^2 + 6x + 9 + 4x^2 + 40x + 100 = 16x^2 - 16x + 4$$

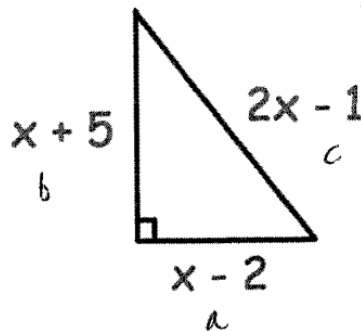
$$5x^2 + 46x + 109 = 16x^2 - 16x + 4$$

$$0 = 11x^2 - 62x - 105$$

QED

(4)

24.



Shown is a right angled triangle with sides are measured in centimetres.

(a) Show that $x^2 - 5x - 14 = 0$

$$\begin{aligned}(x-2)^2 + (x+5)^2 &= (2x-1)^2 \\ x^2 - 4x + 4 + x^2 + 10x + 25 &= 4x^2 - 4x + 1 \\ 2x^2 + 6x + 29 &= 4x^2 - 4x + 1 \\ 0 &= 2x^2 - 10x - 28 \\ 0 &= x^2 - 5x - 14\end{aligned}$$

(4)

(b) Find x .

$$\begin{aligned}(x-7)(x+2) &= 0 \\ x &= 7 \quad x = -2 \\ \checkmark &\end{aligned}$$

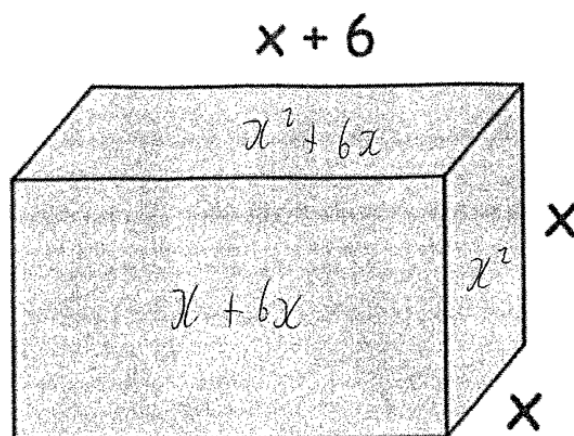
7cm
(2)

(c) Find the area of the triangle.

$$\frac{1}{2} \times 5 \times 12$$

30cm²
(1)

25.



The surface area of the cuboid is 270cm^2 .

(a) Show $x^2 + 4x - 45 = 0$

$$\begin{aligned} 6x^2 + 24x &= 270 \\ 6x^2 + 24x - 270 &= 0 \\ x^2 + 4x - 45 &= 0 \end{aligned}$$

$$\begin{array}{r} x^2 + 6x \\ x^2 + 6x \\ x^2 + 6x \\ x^2 + 6x \\ x^2 \\ + x^2 \\ \hline 6x^2 + 24x \end{array}$$

(4)

(b) Find x .

$$\begin{aligned} (x+9)(x-5) \\ x = -9 \text{ or } x = 5 \end{aligned}$$

$$\begin{array}{r} 5 \\ \hline \end{array} \text{cm} \quad (2)$$

(c) Find the volume of the cuboid.

$$5 \times 5 \times 11$$

$$\begin{array}{r} 275 \\ \hline \end{array} \text{cm}^2 \quad (1)$$

26. Solve

$$\frac{25}{m+3} = m+3$$

$$25 = (m+3)(m+3)$$

$$25 = m^2 + 6m + 9$$

$$0 = m^2 + 6m - 16$$

$$0 = (m+8)(m-2)$$

$$m = -8 \quad m = 2 \quad m = \dots -8 \dots \text{ or } m = \dots 2 \dots$$

(2)

27. A wire of length 20cm is cut into **two** pieces, each of which is bent into a square.

(a) If the length of the side of one square is x cm, show that the length of the side of the other square is $(5 - x)$ cm.

$$\begin{array}{ccc} \begin{array}{c} x \\ \square \\ x \end{array} & \begin{array}{c} 5-x \\ \square \\ 5-x \end{array} & \begin{array}{l} 20-4x \\ \div 4 \\ = 5-x \end{array} \end{array}$$

(2)

The **total** area of the two squares is 14.5cm^2 .

(b) Find the lengths of the two pieces of wire.

$$x^2 + (5-x)^2 = 14.5$$

$$x^2 + 25 - 10x + x^2 = 14.5$$

$$2x^2 - 10x + 10.5 = 0$$

$$4x^2 - 20x + 21 = 0$$

$$(2x-3)(2x-7) = 0$$

$$2x = 3$$

$$x = \frac{3}{2} \text{ or } 1.5$$

$$2x - 7 = 0$$

$$2x = 7$$

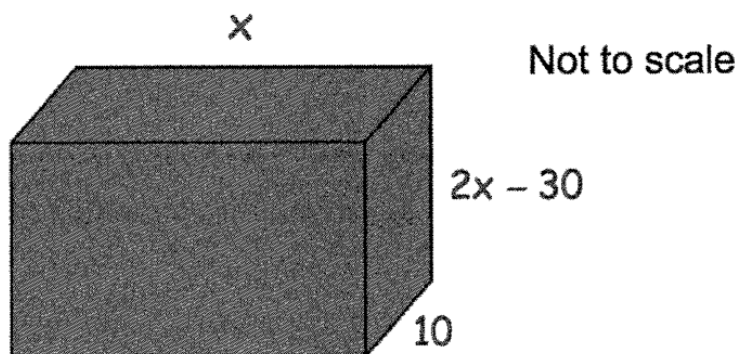
$$x = \frac{7}{2} \text{ or } 3.5$$

$$\dots 6 \dots \text{ and } \dots 14 \dots \text{cm}$$

(4)

$$4 \times 1.5 = 6$$

28. The diagram shows a cuboid.
The volume of the cuboid is 5000cm^3 .



- (a) Show $2x^2 - 30x - 500 = 0$

$$x \times 10 \times 2x - 30 = 5000$$

$$10x(2x - 30) = 5000$$

$$20x^2 - 300x = 5000$$

$$20x^2 - 300x - 5000 = 0$$

$$2x^2 - 30x - 500 = 0$$

(3)

- (b) Solve $2x^2 - 30x - 500 = 0$ to find x , the length of the cuboid.

$$x^2 - 15x - 250$$

$$(x - 25)(x + 10) = 0$$

$$x = 25 \quad \text{or} \quad x = -10$$

.....25.....cm
(3)