

1. Solve by factorisation

(a) $3x + x^2 = 0$

(b) $x^2 + 6x - 7 = 0$

(c) $2x^2 + x - 1 = 0$

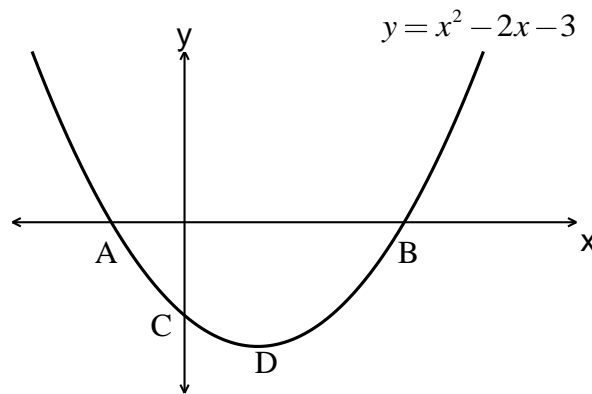
2. Solve, giving the roots correct to one decimal place, $2x^2 - 5x + 1 = 0$.

3. (a) Solve $x^2 - 6x + 5 = 0$.

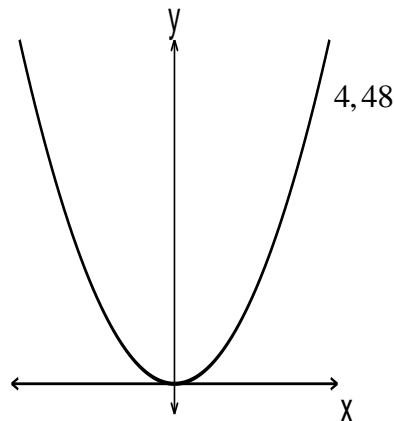
- (b) Hence sketch the graph of $y = x^2 - 6x + 5$.

Your sketch graph should show the intersections with the coordinate axes and the turning point.

4. The sketch below shows part of the graph of $y = x^2 - 2x - 3$.
Find the coordinates of the points A, B, C and D.



5. The sketch below shows part of the graph of $y = kx^2$. The graph passes through the origin and the point $4, 48$.
Find the value of k .

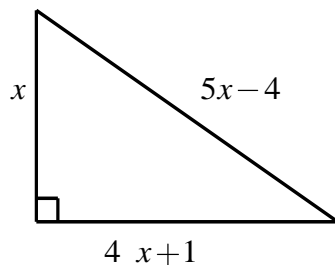


6. Solve the following simultaneous linear equations.

(a) $3x + 4y = 2$
 $2x + 5y = -1$

(b) $2x + y = 7$
 $y = x - 2$

7. The triangle sketched below is right-angled. Find the value of x .



8. 3 cows and 5 sheep cost £900.
4 cows and 10 sheep cost £1400.
Find the cost of each animal.

9. Simplify:

(a) $x^3 \times x^4 \times x^{-1}$

(b) $y^2 \div y^{-3}$

(c) $\frac{a^4 \times a^2}{a^{-1}}$

(d) $t^{-2}(t^4 + t - 1)$

(e) $y^{\frac{1}{2}}(y^{-\frac{1}{2}} - y^{\frac{1}{2}})$

(f) $8h^6 \div 2h^2$

10. Find the value of:

(a) $36^{\frac{1}{2}}$

(b) $8^{-\frac{1}{3}}$

(c) $25^{-\frac{1}{2}}$

11. (a) Simplify $2a \times a^{-4}$

(b) Solve for x , $\sqrt{x} + \sqrt{18} = 4\sqrt{2}$

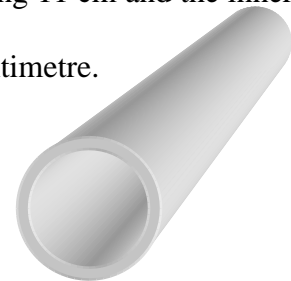
12. The diagram below shows a length of old sewer pipe.

The cross-section consists of two concentric circles, the outer radius being 11 cm and the inner radius being 9 cm.

The metal from which the pipe is made weighs 6.8 grams per cubic centimetre.

Calculate the weight in tonnes of a 100 metre length of the pipe.

Give your final answer to 2 significant figures.



13. (a) On the same coordinate diagram draw accurate graphs of the straight lines with equations $2x + y = 12$ and $y = x - 9$.

(b) Use your graphs to solve the simultaneous linear equations

$$2x + y = 12$$

$$y = x - 9$$