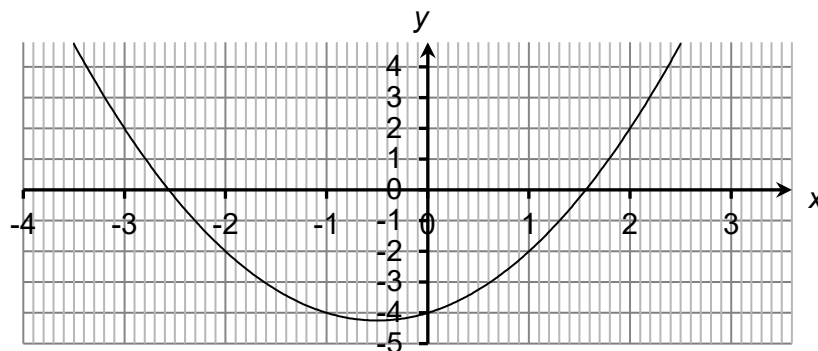


## Foundation Check In – 6.03 Algebraic equations

1. Solve  $5x + 9 = 11$ .
2. Solve  $4(x + 8) = 3(6 - x)$ .
3. Solve  $x^2 - 2x - 15 = 0$ .
4. Solve  $x^2 - 11x + 28 = 0$ .
5. Solve algebraically these simultaneous equations.

$$\begin{aligned}2x + 5y &= 17 \\ x &= 3y + 3\end{aligned}$$

6. The graph shows the quadratic equation  $y = x^2 + x - 4$ . Explain how the graph can be used to find the approximate solutions of the equation  $x^2 + x - 4 = 0$ .



7. Karolina owns 19 pets. Each pet is either a guinea pig or a bird. The pets have a total of 46 legs. Write down two equations from this information.
8. Explain how the graph of the equations  $y = 2x - 1$  and  $y = x + 1$  could be used to solve the equations simultaneously.
9. A rectangle has an area of  $104 \text{ cm}^2$  and sides of length  $x \text{ cm}$  and  $(x + 5) \text{ cm}$ . Calculate the lengths of the two sides.
10. 1000 tickets are sold for a charity event. Adult tickets cost £5, children's tickets cost £2 and a total of £4175 is collected. How many tickets of each type are sold?

### Extension

Penny leaves Liverpool at 08.15 and travels at a steady speed of 25 mph. Isabella leaves Liverpool two hours later and travels at a steady speed of 30 mph. If we assume that they keep to these speeds, at what time will Isabella catch up with Penny and how far will they have travelled?



## Answers

1.  $x = \frac{2}{5}$
2.  $x = -2$
3.  $(x + 3)(x - 5) = 0$  so  $x = -3$  and  $x = 5$
4.  $(x - 4)(x - 7) = 0$  so  $x = 4$  and  $x = 7$
5.  $x = 6$  and  $y = 1$
6. The solutions are where the graph cuts the  $x$ -axis ( $x \approx -2.6$  and  $x \approx 1.6$ ).
7.  $g + b = 19$  and  $4g + 2b = 46$
8. Draw the two straight lines and where they intersect is the solution ( $x = 2$  and  $y = 3$ ).
9. 8 cm and 13 cm
10. 725 adults and 275 children

## Extension

20. 15 and 300 miles

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Solve a linear equation in one unknown			
AO1	2	Solve a linear equation with brackets and unknown on both sides of the equation			
AO1	3	Solve a quadratic equation by factorising			
AO1	4	Solve a quadratic equation by factorising			
AO1	5	Solve two linear simultaneous equations in two variables			
AO2	6	Use a graph to find approximate solutions of a quadratic equation			
AO2	7	Set up two simultaneous equations from quantities given in a worded scenario			
AO2	8	Explain how a graph can be used to find the approximate solution of two linear simultaneous equations			
AO3	9	Set up and solve a quadratic equation by factorising			
AO3	10	Set up and solve two linear simultaneous equations in two variables			

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