

Solve one- and two-step equations and inequalities with brackets

R

1 Jack and Whitney are solving the equation $4(x - 7) = 32$.
Jack says, "I am going to expand the brackets first."
Whitney says, "I am going to divide both sides by 4 first."

a) Show that both methods give the same answer.

$$4(x - 7) = 32$$

$$4x - 28 = 32$$

$$4x = 60$$

$$x = 15$$

$$4(x - 7) = 32$$

$$x - 7 = 8$$

$$x = 15$$

$$x = 15$$

b) Solve the equations.

$$3(x + 5) = 27$$

$$x = 4$$

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

$$x = \frac{11}{4}$$

2 Rearrange the cards into the correct order to solve the equation $-2(3 - 4x) = 16$

$$-2(3 - 4x) = 16$$

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$$8x = 22$$

$$-6 + 8x = 16$$

$$x = 2.75$$

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$$-6 + 8x = 16$$

$$x = 22 \div 8$$

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$$x = 2.75$$

Can you solve the equation in a different way? Discuss with a partner.

3 Solve the equations.

a) $3(f - 2) = 3$

$$f = 3$$

c) $-8 = -2(t - 4)$

$$t = 8$$

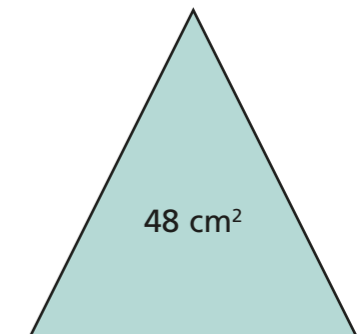
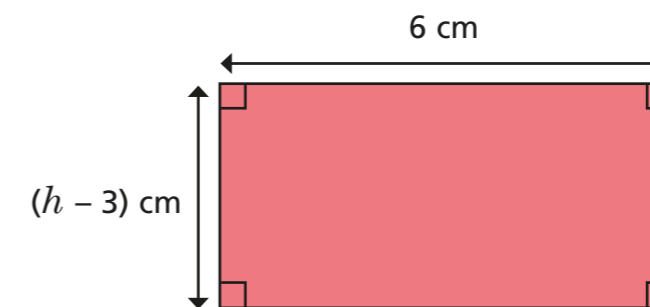
b) $5(4 - 2g) = 40$

$$g = -2$$

d) $3(c + 2) - 5 = 9$

$$c = \frac{8}{3}$$

4 The rectangle has the same area as the triangle.



a) Form an equation and find the value of h .

$$6(h - 3) = 48$$

$$h - 3 = 8$$

$$h = 11$$

$$h = 11$$

b) Work out the perimeter of the rectangle.

$$28 \text{ cm}$$



- 5 Large chocolate bars are 20p more expensive than small chocolate bars.
- a) Dexter buys 3 small and 3 large chocolate bars for a total cost of £5.40. Form and solve an equation to find the cost of each bar.

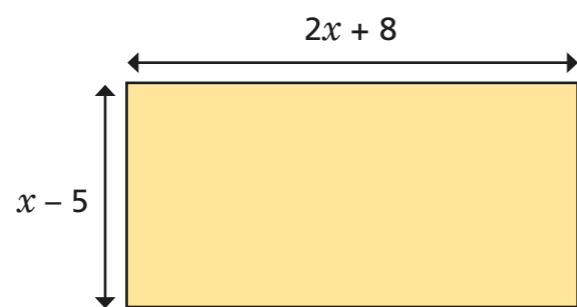
$$\begin{aligned}
 l &= s + 20 \\
 &= 100 \\
 3l + 3s &= 540 \\
 3(s + 20) + 3s &= 540 \\
 3s + 60 + 3s &= 540 \\
 6s &= 480 \\
 s &= 80
 \end{aligned}$$

small bar = 80p large bar = £1

- b) How many different ways can Dexter spend exactly £5 on chocolate bars? Explain your answer.

5 × large or 5 × small + 1 × large

- 6 The perimeter of this rectangle is 51 cm.



Work out the area of the rectangle.

$$\begin{aligned}
 6x + 6 &= 51 \\
 6x &= 45 \\
 x &= 7.5
 \end{aligned}$$

area = 57.5cm²

- 7 Solve the inequality $-6(5 - 2t) \geq -18$

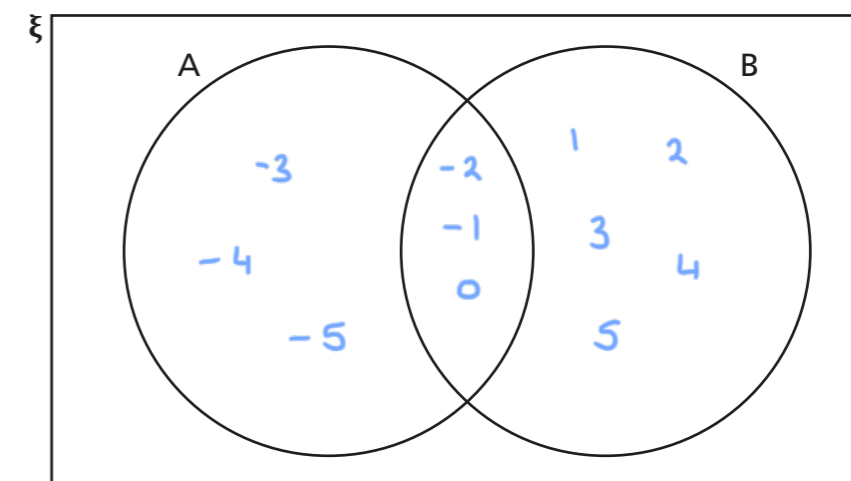
$t \geq 1$

- 8 Solve the inequalities and fill in the Venn diagram.

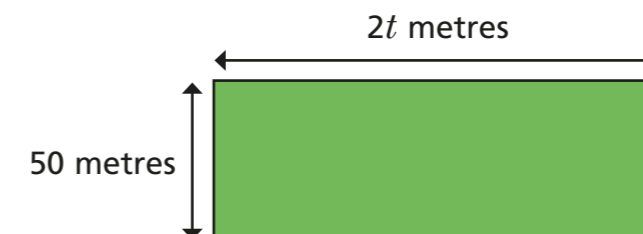
$\xi = \{x \text{ integer}; -5 \leq x \leq 5\}$ -5 -4 -3 -2 -1 0 1 2 3 4 5

$A = \{4(x + 2) < 12\}$ $x < 1$

$B = \{-3 \leq 2x + 1\}$ $x \geq -2$



- 9 A rectangular field has these measurements.



Kim walks around the edge of the field. She walks less than 1 km.

- a) Form and solve an inequality to find the possible values of t .

$$\begin{aligned}
 4t + 100 &< 1000 \\
 4t &< 900 \\
 t &< 225
 \end{aligned}$$

$t < 225$

- b) What is the smallest value that t can be?