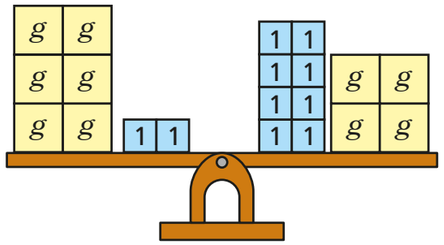
Solve equations with unknowns on both sides

1 Here are some scales.

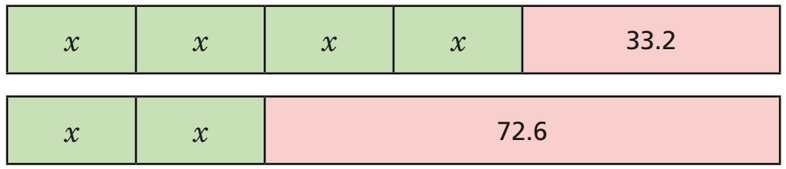


a) What equation is represented by the scales?

b) Solve the equation to work out the value of g.

$g =$ ☐

2 Here is a bar model.



a) What equation is represented by the bar model?

b) Solve the equation to work out the value of x.

$x =$ ☐

3 **a)** Draw a diagram to represent the equation $3y + 8 = 5y + 5$

b) Solve the equation.

$y =$ ☐

4 Solve the equations.

a) $4h + 7 = h + 28$

$h =$ ☐

b) $15j + 25 = 42.85 + 5j$

$j =$ ☐

c) $\frac{1}{2}k + 5 = k + 2$

$k =$ ☐

d) $3(m + 5) = 10m + 1$

$m =$ ☐

e) $4n - 9.5 = \frac{1}{2}(n + 9)$

$n =$ ☐

f) $18 - 2p = p + 3$

$p =$ ☐

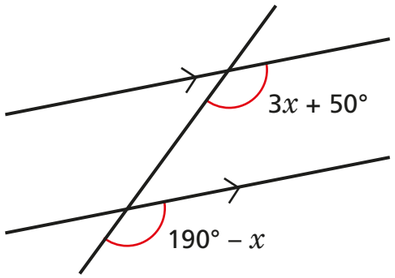
5 Esther says that the two equations have the same solution.

Solve the two equations.

$3x + 9 = x - 8$	$x + 9 = 3x - 8$

Comment on the mistake Esther has made.

6 Two angles are shown on the diagram.

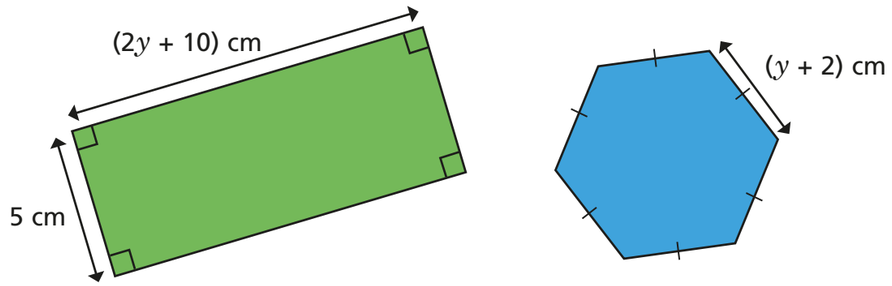


a) Explain why $3x + 50 = 190 - x$

b) Solve the equation to work out the value of x.

$x =$ ☐

7 The perimeter of the rectangle is equal to the perimeter of the regular hexagon.



a) Explain why $2(2y + 15) = 6(y + 2)$.

b) Solve the equation to find the value of y.

$y =$ ☐

8 Solve the equations.

a) $-f + 10 = 16 - 3f$

$f =$ ☐

b) $10 - f = -16 - 3f$

$f =$ ☐

9 Tick the equations that do not have a solution.

$2(x + 6) = 17 - 2x$	$6(5 + 2x) = 12x - 5$
$3(9 - 2x) = -2(5 + 3x)$	$12 - 4x = -4(5 - x)$

Discuss with a partner why this happens.