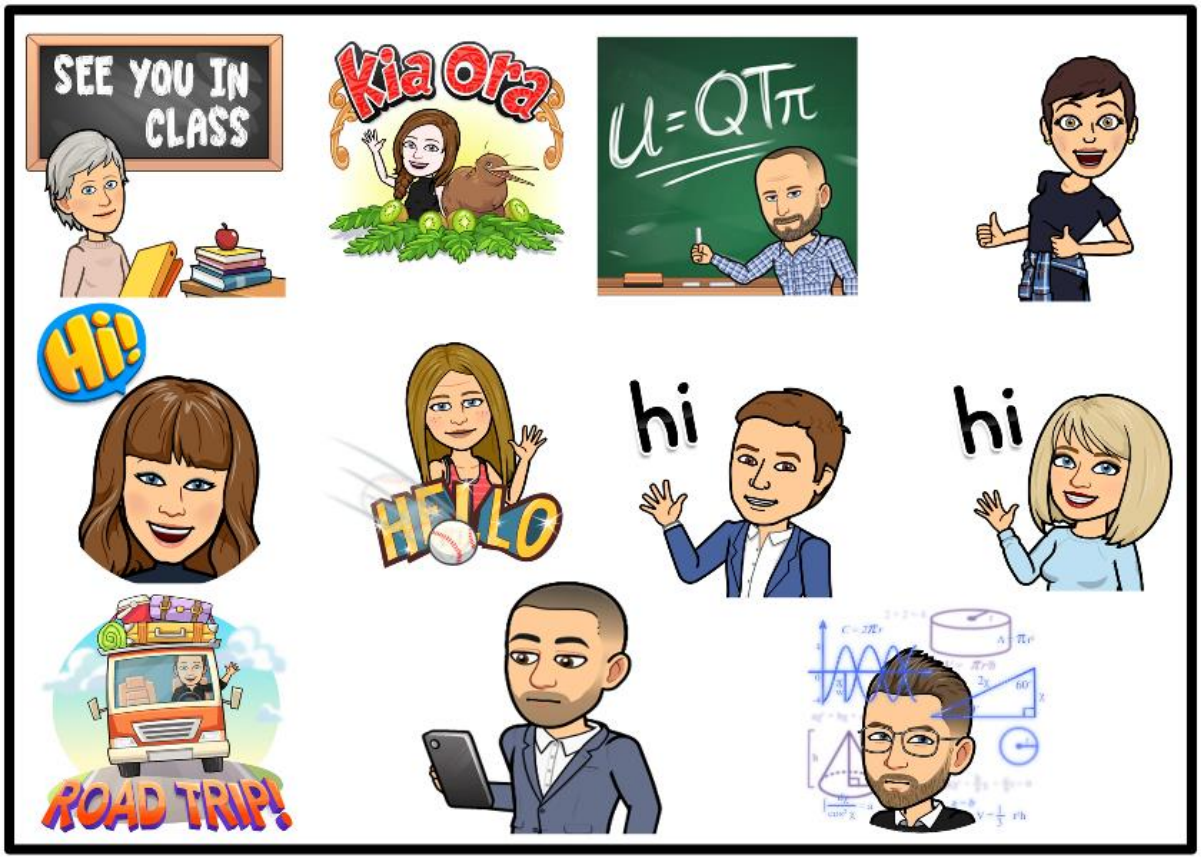
BOOKLET 6

Year 10

Foundation



Solving Equations 1 (lesson 1)

Using inverse operations to solve equations

Solve the following equations using inverse operations

$5x = 45$

$x = 45 \div 5$

$x = 9$

Check:

$5 \times 9 = 45$

$17 - x = 6$

$17 = 6 + x$

$17 - 6 = x$

$11 = x$

$x = 11$

We always write the letter before the equals sign.

Check:

$17 - 11 = 6$

If you are stuck on this- watch the video

https://corbettmaths.com/2012/08/24/solving-equations/

Question 1: Solve the following equations

(a) $w + 5 = 7$ (b) $c + 2 = 10$ (c) $a - 1 = 6$ (d) $x - 4 = 5$

(e) $x + 4 = 13$ (f) $3w = 12$ (g) $2x = 18$ (h) $\frac{w}{2} = 6$

(i) $\frac{x}{4} = 7$ (j) $5y = 30$ (k) $x + 10 = 40$ (l) $2x = 34$

(m) $x - 9 = 7$ (n) $\frac{m}{6} = 8$ (o) $w - 15 = 35$ (p) $\frac{x}{10} = 5$

(q) $11y = 55$ (r) $2x = 11$ (s) $b + 6 = 4$ (t) $\frac{x}{3} = 1.5$

(u) $4y = 10$ (v) $10g = 37$ (w) $a - 7 = -3$ (x) $v + 2 = -6$

(y) $\frac{w}{4} = 2.7$ (z) $5y = 24$

Solving equations two step (lesson 2)

Using inverse operations to solve equations

Solve the following equations using inverse operations.

$\frac{x}{7} = 3$

$x = 3 \times 7$

$x = 21$

Check:

$\frac{21}{7} = 3$

$3x - 4 = 14$

$3x = 14 + 4$

$3x = 18$

$x = 18 \div 3$

$x = 6$

Check:

$3 \times 6 - 4 = 14$

If you are stuck on this- watch the video

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Question 2 Solve the following equations

(a) $2x + 3 = 9$ (b) $3w - 1 = 14$ (c) $7y + 2 = 30$

(d) $5x + 20 = 35$ (e) $6c - 12 = 48$ (f) $8m - 4 = 20$

(g) $7w + 13 = 90$ (h) $12p - 18 = 30$ (i) $9w - 5 = 67$

(j) $10a + 40 = 100$ (k) $9x - 24 = 84$ (l) $7w + 1 = 1$

(m) $6x - 19 = 5$ (n) $3w + 4 = 43$ (o) $\frac{x}{3} + 1 = 5$

(p) $\frac{c}{2} - 4 = 6$ (q) $\frac{x}{10} + 3 = 9$ (r) $\frac{n}{9} - 8 = 1$

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Solving Equations involving division (lesson 3)

Solving equations involving division

Linear equations with unknowns on both sides can also involve division.

For example, $\frac{3x + 2}{4} = 11 - x$

In this case we must start by multiplying both sides of the equation by 4.

$3x + 2 = 4(11 - x)$

Multiply out the brackets: $3x + 2 = 44 - 4x$

Add $4x$ to both sides: $7x + 2 = 44$

Subtract 2 from both sides: $7x = 42$

Divide both sides by 7: $x = 6$

If you are stuck on this- watch the video

https://corbettmaths.com/2012/08/24/solving-equations/

Question 4: Solve the following equations

(a) $\frac{x + 1}{2} = 9$ (b) $\frac{x - 3}{4} = 8$ (c) $\frac{m - 8}{5} = 3$

(d) $\frac{2x}{3} = 6$ (e) $\frac{3x}{5} = 30$ (f) $\frac{5x}{4} = 20$

(g) $\frac{2x}{7} + 2 = 12$ (h) $\frac{8x}{3} - 9 = 7$ (i) $\frac{3x}{10} - 4 = 8$

(j) $\frac{10m + 20}{15} = 6$ (k) $\frac{2x + 5}{3} = 7$ (l) $\frac{7x - 5}{10} = 10$

Solving equations with letters on both sides (lesson 4)

Solving the equation

Let's solve this equation by transforming both sides of the equation in the same way.

$3n - 11 = 2n - 3$	Start by writing the equation down.
$-2n$ $-2n$	Subtract $2n$ from both sides.
$n - 11 = -3$	Always line up the equals signs.
$+11$ $+11$	Add 11 to both sides.
$n = 8$	This is the solution.

We can check the solution by substituting it back into the original equation:

$3 \times 8 - 11 = 2 \times 8 - 3$ ✓

Solving the equation

Let's solve this equation by transforming both sides of the equation in the same way.

$4n = n + 9$	Start by writing the equation down.
$-n$ $-n$	Subtract n from both sides.
$3n = 9$	Always line up the equals signs.
$\div 3$ $\div 3$	Divide both sides by 3.
$n = 3$	This is the solution.

We can check the solution by substituting it back into the original equation:

$4 \times 3 = 3 + 9$ ✓

If you are stuck on this- watch the video

https://corbettmaths.com/2012/08/24/solving-equations-with-letters-on-both-sides/

Question 1: Solve the following equations

(a) $4x + 1 = 2x + 7$ (b) $5x + 4 = 3x + 16$ (c) $2x + 8 = x + 12$

(d) $7x + 1 = 2x + 46$ (e) $6x - 3 = 2x + 13$ (f) $9x - 10 = 7x + 24$

(g) $2x + 21 = 4x + 5$ (h) $x + 2 = 5x - 2$ (i) $6x - 9 = 4x - 1$

(j) $5x + 2 = 16 - 2x$ (k) $3x - 1 = 23 - x$ (l) $6x + 8 = 38 - 4x$

(m) $80 - x = 8x - 1$ (n) $2x + 7 = 17 - 8x$ (o) $15 - x = 27 - 3x$

(p) $12x - 20 = 15x - 38$ (q) $35x + 10 = 20x + 175$ (r) $14x = 2x + 60$

Lesson 1 Answers

Question 1

(a) w =2	(b) c = 8	(c) a = 7
(d) x = 9	(e) x = 9	(f) w = 4
(g) x = 9	(h) w = 12	(i) x = 28
(j) y = 6	(k) x = 30	(l) x = 17
(m) x = 16	(n) m = 48	(o) w = 50
(p) x = 50	(q) y = 5	(r) x = 5.5
(s) b = -2	(t) x = 4.5	(u) y = 2.5
(v) g = 3.7	(w) a = 4	(x) v = -8
(y) w = 10.8	(z) y = 4.8	

Lesson 2 Answers

Question 2

(a) x = 3	(b) w = 5	(c) y = 4
(d) x = 3	(e) c = 10	(f) m = 3
(g) w = 11	(h) p = 4	(i) I = 8
(j) a = 6	(k) x = 12	(l) w = 0
(m) x = 4	(n) w = 13	(o) x = 12
(p) c = 20	(q) x = 60	(r) n = 81

Lesson 3 Answers

Question 4

(a) x = 17	(b) x = 35	(c) m = 23
(d) x = 9	(e) x = 50	(f) x = 16
(g) x = 35	(h) x = 6	(i) x = 40
(j) m = 7	(k) x = 8	(l) x = 15

Lesson 4 Answers

Question 1:

(a) x = 3	(b) x = 6	(c) x = 4	(d) x = 9
(e) x = 4	(f) x = 17	(g) x = 8	(h) x = 1
(i) x = 4	(j) x = 2	(k) x = 6	(l) x = 3
(m) x = 9	(n) x = 1	(o) x = 6	(p) x = 6
(q) x = 11	(r) x = 5		