

## Solving equations

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)  $5y = 24$

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)  $\frac{n}{9} - 8 = 1$

## Solving inequalities

Don't worry about the inequality sign looking different, just treat it like a normal equation, but keep the inequality not an equals.

Video: <https://corbettmaths.com/2013/05/07/solving-inequalities-one-sign-corbettmaths/>

**Question 1:** Solve each of the inequalities below

(a)  $x + 4 > 9$     (b)  $x - 3 < 2$     (c)  $2x \leq 14$     (d)  $8x < 16$

(e)  $5x \geq 15$     (f)  $\frac{x}{3} > 4$     (g)  $\frac{x}{5} \leq 2$     (h)  $x + 6 \geq 4$

**Question 2:** Solve each of the inequalities below

(a)  $2x + 1 \leq 9$     (b)  $3x - 5 > 16$     (c)  $4x + 8 < 32$     (d)  $5x - 2 \geq 68$

(e)  $\frac{x}{2} + 1 \leq 5$     (f)  $\frac{x}{9} - 6 > 4$     (g)  $\frac{x+3}{2} \geq 5$     (h)  $\frac{x-5}{4} > 2$

**Question 3:** Solve each inequality below and represent the solution on a number line.

(a)  $4x + 7 < 11$     (b)  $3x - 2 \geq 10$     (c)  $\frac{x}{2} - 3 > 0$     (d)  $\frac{x+18}{4} \leq 5$

**Question 4:** Solve each of the inequalities below

(a)  $5(x - 3) \geq 40$     (b)  $6(x + 2) < 42$     (c)  $2(5x + 1) \leq 36$

(d)  $4(x - 2) < 18$     (e)  $2(2x - 9) \geq 22$     (f)  $3(2x + 7) \leq 9$

**Question 5:** Solve each of the inequalities below

(a)  $4x + 3 > 2x + 11$     (b)  $x + 1 \geq 3x - 18$

(c)  $13x - 12 < 3x + 13$     (d)  $7x - 5 \geq 3x + 11$

# Collecting like terms (simplifying)

Video: <https://corbettmaths.com/2013/12/28/collecting-like-terms-video-9/>

Question 1: Simplify each of the following

- (a)  $y + y + y + y$       (b)  $w + w + w + w + w$       (c)  $a + a + a + a + a + a$       (d)  $s + s + s$   
(e)  $n + n$       (f)  $g + g + g + g - g$       (g)  $y + y + y + y - y - y$       (h)  $p + p - p - p$   
(i)  $3y + 2y$       (j)  $4a + 3a$       (k)  $9k + 5k$       (l)  $7m + m$   
(m)  $15c + 20c$       (n)  $6w - 3w$       (o)  $10y + 3y - 5y$       (p)  $20t - 14t$   
(q)  $7x - 3x - x$       (r)  $8k - 8k$       (s)  $7y - 2y + y$       (t)  $5u - 4u$   
(u)  $y^2 + y^2$       (v)  $a^2 + a^2 + a^2$       (w)  $c^2 + c^2 + c^2 + c^2 + c^2$       (x)  $7y^2 + 3y^2$   
(y)  $2w^2 + 4w^2 + 8w^2$       (z)  $6y^2 - 2y^2 + 3y^2$

Question 2: Simplify the following expressions

- (a)  $4u - 6u$       (b)  $8w - 9w$       (c)  $4a + 2a - 9a$       (d)  $2y - 9y$   
(e)  $-3g - 2g$       (f)  $-4f + 9f$       (g)  $-m - 7m$       (h)  $5y^2 - 7y^2$   
(i)  $6a^2 + 2a^2 - 9a^2$       (j)  $ab + ab + ab$

Question 3: Simplify the following expressions

- (a)  $3a + 2b + 4a + b$       (b)  $7y + 5y + 2h + 2h$       (c)  $g + 8a + 2a + g$   
(d)  $7m + 7p + 8m + p + 2p$       (e)  $9e + 2 + e + 2$       (f)  $4 + 3a + 2a + 8$   
(g)  $2y + 4 + 3y - 1$       (h)  $8 + 3w - w - 3$       (i)  $5 - 4s - 2 + 10s$   
(j)  $3x + 6y + 5x - 2y$       (k)  $6m - 2s + 11s + m$       (l)  $2a + 3b - 2 + a + 3b + 4$   
(m)  $3a - 2b + a - 5b$       (n)  $2x - 2y - 6x + 5y$       (o)  $y - 4m - 3y - 5m$

# substitution into formula

Video <https://corbettmaths.com/2012/08/20/substitution-into-expressions/>

Question 1: If  $a = 7$   $b = 10$   $c = 3$   $d = 8$  and  $e = 15$   
Find the value of each expression.

(a)  $a + 5$

(b)  $b - 4$

(c)  $c + d$

(d)  $e - d$

(e)  $2a$

(f)  $4b$

(g)  $3e$

(h)  $5c$

(i)  $\frac{b}{2}$

(j)  $\frac{e}{5}$

(k)  $\frac{d}{4}$

(l)  $\frac{a}{2}$

(m)  $a^2$

(n)  $b^2$

(o)  $c^2$

(p)  $d^2$

(q)  $2a + 1$

(r)  $3b - 7$

(s)  $9c + 11$

(t)  $4e - 45$

(u)  $2a + 3c$

(v)  $4d - b$

(w)  $5a + 2d$

(x)  $e - 4c$

(y)  $30 - 4a$

(z)  $15 - 3c$

Question 2: If  $f = 5$   $g = 6$   $h = 4$  and  $i = 2$   
Find the value of each expression.

(a)  $fg$

(b)  $hi$

(c)  $fgh$

(d)  $i^3$

(e)  $\sqrt{h}$

(f)  $3f + 2g$

(g)  $5h + 7i$

(h)  $9h - 7i$

Question 3: If  $a = -2$   $b = 5$   $c = -6$   $d = 10$  and  $e = 9$   
Find the value of each expression.

(a)  $a + 4$

(b)  $b - 8$

(c)  $c + e$

(d)  $a - d$

(e)  $d - c$

(f)  $2c$

(g)  $7a$

(h)  $-7b$

(i)  $2d + 3c$

(j)  $6e + 3a$

(k)  $5a + 7$

(l)  $20 + 4a$

(m)  $ac$

(n)  $40 - d$

(o)  $2e - a$

(p)  $bd + a$

(q)  $\frac{a}{2}$

(r)  $\frac{d}{4}$

(s)  $\sqrt{e}$

(t)  $c^2$