Lesmahagow High School

Mathematics Department

S2 Solving Linear Equations

Solving linear equations

1. Solve :

(a)	$x + 3 = 5$	**(b)**	$x + 5 = 9$	**(c)**	$x + 9 = 12$	**(d)**	$x + 2 = 7$
(e)	$a + 2 = 4$	**(f)**	$y + 3 = 8$	**(g)**	$p + 7 = 11$	**(h)**	$c + 4 = 5$
(i)	$b + 7 = 9$	**(j)**	$q + 8 = 8$	**(k)**	$d + 5 = 10$	**(l)**	$x + 1 = 6$
(m)	$c + 4 = 6$	**(n)**	$p + 6 = 13$	**(o)**	$a + 2 = 15$	**(p)**	$y + 5 = 14$

2. Solve:

(a)	$2x = 6$	**(b)**	$5x = 20$	**(c)**	$8x = 16$	**(d)**	$3x = 27$
(e)	$4a = 16$	**(f)**	$7y = 28$	**(g)**	$6p = 18$	**(h)**	$5c = 25$
(i)	$9b = 36$	**(j)**	$2q = 18$	**(k)**	$7d = 70$	**(l)**	$4x = 32$
(m)	$8c = 56$	**(n)**	$3p = 15$	**(o)**	$5a = 35$	**(p)**	$6y = 42$

3. Solve :

(a)	$x - 3 = 4$	**(b)**	$x - 5 = 1$	**(c)**	$x - 9 = 2$	**(d)**	$x - 2 = 7$
(b)	$a - 2 = 4$	**(f)**	$y - 3 = 8$	**(g)**	$p - 7 = 11$	**(h)**	$c - 4 = 5$
(j)	$b - 7 = 9$	**(j)**	$q - 8 = 8$	**(k)**	$d - 5 = 10$	**(l)**	$x - 1 = 6$
(m)	$c - 4 = 6$	**(n)**	$p - 6 = 14$	**(o)**	$a - 2 = 15$	**(p)**	$y - 5 = 14$

4. Solve:

(a)	$2a = 36$	**(b)**	$5m = 55$	**(c)**	$8q = 64$	**(d)**	$3y = 48$
(e)	$4x = 52$	**(f)**	$7c = 63$	**(g)**	$6d = 72$	**(h)**	$5a = 125$
(i)	$9p = 81$	**(j)**	$2q = 17$	**(k)**	$4x = 22$	**(l)**	$6q = 33$
(m)	$8c = 28$	**(n)**	$5x = 90$	**(o)**	$10a = 42$	**(p)**	$4y = 42$

5. Solve :

(a)	$2x + 3 = 5$	**(b)**	$4x + 5 = 9$	**(c)**	$3x + 3 = 12$	**(d)**	$5x + 2 = 7$
(e)	$2a + 2 = 14$	**(f)**	$5y + 3 = 18$	**(b)**	$2p + 7 = 21$	**(h)**	$3c + 4 = 16$
(i)	$6b + 7 = 49$	**(j)**	$8q + 8 = 8$	**(k)**	$2d + 5 = 35$	**(l)**	$3x + 5 = 26$
(m)	$8c + 4 = 36$	**(n)**	$7p + 6 = 55$	**(o)**	$12a + 2 = 26$	**(p)**	$9y + 5 = 50$

6. Solve :

(a)	$3x - 2 = 7$	**(b)**	$4x - 5 = 11$	**(c)**	$2x - 9 = 3$	**(d)**	$3x - 7 = 5$
(e)	$7a - 2 = 12$	**(f)**	$5y - 3 = 22$	**(g)**	$6p - 7 = 29$	**(h)**	$4c - 3 = 29$
(i)	$8b - 7 = 57$	**(j)**	$10q - 8 = 72$	**(k)**	$3d - 5 = 31$	**(l)**	$9x - 1 = 80$
(m)	$4c - 9 = 15$	**(n)**	$6p - 2 = 40$	**(o)**	$5a - 2 = 73$	**(p)**	$3y - 14 = 40$

7. Solve :

(a)	$\frac{1}{2}x = 6$	**(b)**	$\frac{1}{4}x = 5$	**(c)**	$\frac{1}{3}x = 7$	**(d)**	$\frac{1}{8}x = 3$
(e)	$\frac{1}{5}x = 2$	**(f)**	$\frac{1}{3}x = 3$	**(g)**	$\frac{1}{7}x = 4$	**(h)**	$\frac{1}{2}x = 8$
(i)	$\frac{1}{4}x = 1$	**(j)**	$\frac{1}{6}x = 8$	**(k)**	$\frac{1}{5}x = 10$	**(l)**	$\frac{1}{3}x = 9$

8. Multiply out the brackets and solve :

(a)	$2(x + 5) = 12$	**(b)**	$5(y + 7) = 45$	**(c)**	$3(a + 6) = 36$
(d)	$6(x + 4) = 54$	**(e)**	$4(x + 9) = 48$	**(f)**	$3(c + 8) = 30$
(g)	$7(d + 3) = 56$	**(h)**	$5(m + 5) = 55$	**(i)**	$2(y + 14) = 50$
(j)	$8(d - 6) = 24$	**(k)**	$3(s - 8) = 9$	**(l)**	$4(x - 15) = 20$
(m)	$10(w - 2) = 50$	**(n)**	$5(c - 5) = 35$	**(o)**	$3(a - 10) = 33$

9. Solve :

(a) $6y + 3 = y + 18$

(b) $5a + 7 = a + 15$

(c) $9c + 5 = c + 21$

(d) $10x + 1 = 4x + 19$

(e) $5b + 3 = 2b + 9$

(f) $7n + 6 = 3n + 18$

(g) $3x + 2 = x + 14$

(h) $9c + 58 = 6c + 73$

(i) $16 + 7y = 2y + 31$

(j) $15a + 4 = 3a + 76$

(k) $16 + 25x = 5x + 96$

(l) $6n + 3 \cdot 5 = 3n + 5$

(m) $19b + 8 = 10b + 80$

(n) $14x + 4 = 3x + 125$

(o) $250 + 3x = 295$

(p) $20y + 4 = 3y + 55$

(q) $13a + 6 = a + 150$

(r) $50x + 40 = 10x + 200$

(s) $19y + 3 = 8y + 80$

(t) $5b + 2 = 2b + 50$

(u) $2 + 14x = 2x + 110$

(v) $20x + 11 = 13x + 60$

(w) $19x + 10 = 4x + 70$

(x) $205a + 13 = 10a + 403$

10. Solve :

(a) $6y - 3 = 3y + 15$

(b) $5a - 9 = a + 15$

(c) $9c - 8 = 4c + 12$

(d) $10x - 1 = 4x + 5$

(e) $5b - 3 = 2b + 9$

(f) $3n - 10 = n + 2$

(g) $7x - 14 = 3x + 2$

(h) $6c - 13 = 3c + 59$

(i) $7y - 16 = 2y + 34$

(j) $15a - 8 = 3a + 76$

(k) $25x - 16 = 5x + 84$

(l) $6n - 3 \cdot 5 = 3n + 4$

(m) $b + 13 = 9b - 7$

(n) $3x + 12 = 4x - 4$

(o) $x + 25 = 3x - 5$

(p) $5y + 4 = 20y - 26$

(q) $a + 6 = 13a - 18$

(r) $10x + 40 = 50x - 120$

(s) $8y + 3 = 19y - 74$

(t) $2b + 2 = 5b - 16$

(u) $2 + 2x = 10x - 14$

(v) $13x + 11 = 20x - 38$

(w) $4x + 10 = 9x - 50$

(x) $10a + 13 = 20a - 387$

11. Solve:

(a) $3(a + 2) = a + 12$ **(b)** $4(x + 3) = 2x + 30$

(c) $5(m + 3) = 2m + 24$ **(d)** $7(d + 1) = 3d + 15$

(e) $8(h + 3) = 3h + 29$ **(f)** $6(y + 1) = 2y + 24$

(g) $4(a + 1) = 2(a + 8)$ **(h)** $7(x + 2) = 4(x + 5)$

(i) $8(a + 2) = 4(a + 28)$ **(j)** $5(d – 1) = 3d + 7$

(k) $6(x – 2) = 3(x + 1)$ **(l)** $7(u – 1) = 3(u + 7)$

(m) $8(w – 1) = 6(w + 4)$ **(n)** $7(x – 2) = 4(x + 1)$

12. Solve each of the following equations

(a) $3x = 12 – x$ **(b)** $5m = 24 – 3m$ **(c)** $y = 21 – 2y$

(d) $5t = 42 – t$ **(e)** $2a = 20 – 2a$ **(f)** $6x = 40 – 4x$

(g) $2y + 1 = 21 – 3y$ **(h)** $p – 3 = 21 – 5p$

(i) $8r – 5 = 45 – 2r$ **(j)** $6 + x = 12 – 2x$

(k) $14 + 4a = 26 – 2a$ **(l)** $2 + 6d = 24 – 5d$

(m) $1 + 3c = 13 – c$ **(n)** $9 + x = 27 – 5x$

(o) $6 + 4x = –2x + 12$ **(p)** $3x + 5 = –4x + 19$

(q) $5v – 1 = –3v + 15$ **(r)** $8 + 7x = –2x + 35$

13. Solve these equations:

(a) $5x – 7 = –2$ **(b)** $3x – 12 = –3$ **(c)** $7y – 15 = –1$

(d) $8v – 8 = 6v – 2$ **(e)** $4h – 1 = 2h – 4$ **(f)** $6a – 16 = a – 6$

(g) $3x – 11 = x – 5$ **(h)** $5m – 18 = m – 6$ **(i)** $8e – 30 = 2e – 6$

(j) $2x – 12 = –3x – 2$ **(k)** $5y – 20 = –2y – 6$ **(l)** $3a – 9 = –2a – 4$

(m) $7x – 13 = –x – 5$ **(n)** $4k – 24 = –2k – 12$ **(o)** $3c – 18 = –c – 2$

Solving linear equations

EXAM QUESTIONS

1. Solve $2x + 9 = 5x - 3$

2. Solve $3a + 13 = 7a - 3$

3. Solve $2x + 13 = 5x - 2$

4. Solve $3x - 11 = 7x + 5$

5. Solve, algebraically, the equation: $5x - 19 = 16 - 2x$

6. Solve algebraically $15 + 7x = 4x - 3$

7. Solve algebraically $8w - 9 = 5w + 21$

8. Solve, algebraically, the equation $12x - 11 = 8x + 5$

9. Solve the equation $20y + 6 = 14y + 24$

10. Solve for x $6x - 7 = 4x + 5$

Solving linear equations

1.	**(a)**	$x = 2$	**(b)**	$x = 4$	**(c)**	$x = 3$	**(d)**	$x = 5$
	(e)	$a = 2$	**(f)**	$y = 5$	**(g)**	$p = 4$	**(h)**	$c = 1$
	(i)	$b = 2$	**(j)**	$q = 0$	**(k)**	$d = 5$	**(l)**	$x = 5$
	(m)	$c = 2$	**(n)**	$p = 7$	**(o)**	$a = 13$	**(p)**	$y = 9$
2.	**(a)**	$x = 3$	**(b)**	$x = 4$	**(c)**	$x = 2$	**(d)**	$x = 9$
	(e)	$a = 4$	**(f)**	$y = 4$	**(g)**	$p = 3$	**(h)**	$c = 5$
	(i)	$b = 4$	**(j)**	$q = 9$	**(k)**	$d = 10$	**(l)**	$x = 8$
	(m)	$c = 7$	**(n)**	$p = 5$	**(o)**	$a = 7$	**(p)**	$y = 7$
3.	**(a)**	$x = 7$	**(b)**	$x = 6$	**(c)**	$x = 11$	**(d)**	$x = 9$
	(b)	$a = 6$	**(f)**	$y = 11$	**(g)**	$p = 18$	**(h)**	$c = 9$
	(j)	$b = 16$	**(j)**	$q = 16$	**(k)**	$d = 15$	**(l)**	$x = 7$
	(m)	$c = 10$	**(n)**	$p = 20$	**(o)**	$a = 17$	**(p)**	$y = 19$
4.	**(a)**	$a = 18$	**(b)**	$m = 11$	**(c)**	$q = 8$	**(d)**	$y = 16$
	(e)	$x = 13$	**(f)**	$c = 9$	**(g)**	$d = 12$ **(h)**	$a = 25$	
	(i)	$p = 9$	**(j)**	$q = 8 \cdot 5$	**(k)**	$x = 5 \cdot 5$	**(l)**	$q = 5 \cdot 5$
	(m)	$c = 3 \cdot 5$	**(n)**	$x = 18$	**(o)**	$a = 4 \cdot 2$	**(p)**	$y = 10 \cdot 5$
5.	**(a)**	$x = 1$	**(b)**	$x = 1$	**(c)**	$x = 3$	**(d)**	$x = 1$
	(e)	$a = 6$	**(f)**	$y = 3$	**(b)**	$p = 7$	**(h)**	$c = 4$
	(i)	$b = 7$	**(j)**	$q = 0$	**(k)**	$d = 15$	**(l)**	$x = 7$
	(m)	$c = 4$	**(n)**	$p = 7$	**(o)**	$a = 2$	**(p)**	$y = 5$
6.	**(a)**	$x = 3$	**(b)**	$x = 4$	**(c)**	$x = 6$	**(d)**	$x = 4$
	(e)	$a = 2$	**(f)**	$y = 5$	**(g)**	$p = 6$	**(h)**	$c = 8$
	(i)	$b = 8$	**(j)**	$q = 8$	**(k)**	$d = 12$	**(l)**	$x = 9$
	(m)	$c = 6$	**(n)**	$p = 7$	**(o)**	$a = 15$	**(p)**	$y = 18$
7.	**(a)**	$x = 12$	**(b)**	$x = 20$	**(c)**	$x = 21$	**(d)**	$x = 24$
	(e)	$x = 10$	**(f)**	$x = 9$	**(g)**	$x = 28$	**(h)**	$x = 16$
	(i)	$x = 4$	**(j)**	$x = 48$	**(k)**	$x = 50$	**(l)**	$x = 27$

8. **(a)** $x = 1$ **(b)** $y = 2$ **(c)** $a = 6$ **(d)** $x = 5$

(e) $x = 3$ **(f)** $c = 2$ **(g)** $d = 5$ **(h)** $m = 6$

(i) $y = 11$ **(j)** $d = 9$ **(k)** $s = 11$ **(l)** $x = 20$

(m) $w = 7$ **(n)** $c = 12$ **(o)** $a = 21$

9. **(a)** $y = 3$ **(b)** $y = 2$ **(c)** $c = 2$ **(d)** $x = 3$

(e) $b = 2$ **(f)** $n = 3$ **(g)** $x = 6$ **(h)** $c = 5$

(i) $y = 3$ **(j)** $a = 6$ **(k)** $x = 4$ **(l)** $n = 0{\cdot}5$

(m) $b = 8$ **(n)** $x = 11$ **(o)** $x = 15$ **(p)** $y = 3$

(q) $a = 12$ **(r)** $x = 4$ **(s)** $y = 7$ **(t)** $b = 16$

(u) $x = 9$ **(v)** $x = 7$ **(w)** $x = 4$ **(x)** $a = 2$

10. **(a)** $y = 6$ **(b)** $a = 6$ **(c)** $c = 4$ **(d)** $x = 1$

(e) $b = 4$ **(f)** $n = 6$ **(g)** $x = 4$ **(h)** $c = 24$

(i) $y = 10$ **(j)** $a = 7$ **(k)** $x = 5$ **(l)** $n = 2{\cdot}5$

(m) $b = 2{\cdot}5$ **(n)** $x = 16$ **(o)** $x = 15$ **(p)** $y = 2$

(q) $a = 2$ **(r)** $x = 4$ **(s)** $x = 7$ **(t)** $b = 6$

(u) $x = 2$ **(v)** $x = 7$ **(w)** $x = 12$ **(x)** $a = 40$

11. **(a)** $a = 3$ **(b)** $x = 9$ **(c)** $m = 3$ **(d)** $d = 2$

(e) $h = 1$ **(f)** $y = 2{\cdot}5$ **(g)** $a = 6$ **(h)** $x = 2$

(i) $a = 24$ **(j)** $d = 6$ **(k)** $x = 5$ **(l)** $u = 7$

(m) $w = 16$ **(n)** $x = 6$

12. **(a)** $x = 3$ **(b)** $m = 3$ **(c)** $y = 7$ **(d)** $t = 7$

(e) $a = 5$ **(f)** $x = 4$ **(g)** $y = 4$ **(h)** $p = 4$

(i) $r = 5$ **(j)** $x = 2$ **(k)** $a = 2$ **(l)** $d = 2$

(m) $c = 3$ **(n)** $x = 3$ **(o)** $x = 1$ **(p)** $x = 2$

(q) $v = 2$ **(r)** $x = 3$

13. **(a)** $x = 1$ **(b)** $x = 3$ **(c)** $y = 2$ **(d)** $v = 3$

(e) $h = -1{\cdot}5$ **(f)** $a = 2$ **(g)** $x = 3$ **(h)** $m = 3$

(i) $e = 4$ **(j)** $x = 2$ **(k)** $y = 2$ **(l)** $a = 1$

(m) $x = 1$ **(n)** $k = 2$ **(o)** $c = 4$

Solving linear equations

EXAM QUESTIONS

1. $x = 4$ **2.** $a = 4$ **3.** $x = 5$ **4.** $x = 4$ **5.** $x = 5$

6. $x = -6$ **7.** $w = 10$ **8.** $x = 4$ **9.** $y = 3$ **10.** $x = 6$