



CAMI Mathematics: Grade 10

GRADE 10 CAPS Curriculum

10.4 Equations and inequalities (A)

1.1 Solve the following linear equations.

(a) $\frac{y}{-11} = -6$

(b) $15 + n = 22$

(c) $13e = 91$

(d) $-8t = 88$

1.2 Solve the following linear equations.

(e) $43p + 16 = 39p + 44$

(f) $10y - 63 = 5y - 38$

(g) $-5n - 54 = -15n - 164$

(h) $-39x + 16 = -49x + 36$

1.3 Solve the following linear equations.

(i) $9x - 9 = 20x - 8 - 20x - 19$

(j) $6y + 15 - 10y + 30 = -15y + 23$

(k) $2r + 61 = 7r + 7 - 11r - 12$

1.4 Solve the following linear equations.

(l) $-2(6y - 6) = 5(-3y + 2) - 13$

(m) $-4(-6f - 3) - 2 = 2(11f - 5)$

(n) $5(4n + 2) = -5(3n + 7) + 5(9 + 5n) - 100$

(o) $-7(-12m + 9) + 90 = -3(3m + 8) + 8(-6 + 13m)$

1.5 Solve the following linear equations.

(p) $t + 2 = \frac{t - 3}{9}$

(q) $12 - n = \frac{n + 12}{7}$

(r) $-10 - x = \frac{x - 7}{10}$

(s) $\frac{8n + 9}{5} = \frac{3n - 8}{8}$

(t) $\frac{3}{4}(n - \frac{5}{3}) = -8 + 4n$



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1.6 Solve the following linear equations.

(u) $\frac{e}{e-8} + \frac{3}{e^2-64} = 1$

(v) $\frac{8y-16}{y^2-6y-16} = \frac{y}{y-8} - \frac{y}{y+2}$

(w) $\frac{x}{x-6} - \frac{7}{x^2-6x} = 1$

2. Solve quadratic equations by factorization.

(a) $16h^2 = -18h$

(b) $d^2 - 169 = 0$

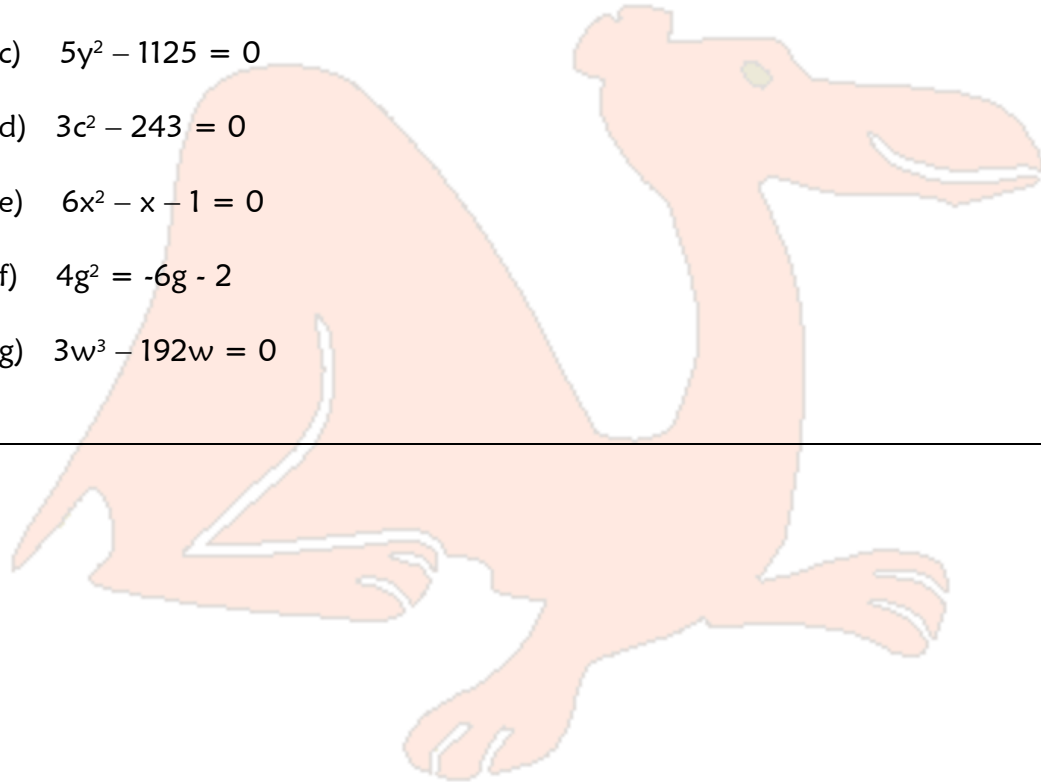
(c) $5y^2 - 1125 = 0$

(d) $3c^2 - 243 = 0$

(e) $6x^2 - x - 1 = 0$

(f) $4g^2 = -6g - 2$

(g) $3w^3 - 192w = 0$





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MEMO

1.1 Solve the following linear equations. [4.2.1.3]

(a)

$$\frac{y}{-11} = -6$$
$$y = 66$$

(b)

$$15 + n = 22$$
$$n = 22 - 15$$
$$n = 7$$

(c)

$$13e = 91$$
$$e = \frac{91}{13}$$
$$e = 7$$

(d)

$$-8t = 88$$
$$t = -11$$

1.2 Solve the following linear equations. [4.2.1.4; 4.2.1.5; 4.2.1.6; 4.2.1.7]

(e)

$$43p + 16 = 39p + 44$$
$$43p - 39p = -16 + 44$$
$$4p = 28$$
$$p = 7$$

(f)

$$10y - 63 = 5y - 38$$
$$10y - 5y = 63 - 38$$
$$5y = 25$$
$$y = 5$$

(g)

$$-5n - 54 = -15n - 164$$
$$-5n + 15n = 54 - 164$$
$$10n = -110$$
$$n = -11$$

(h)

$$-39x + 16 = -49x + 36$$
$$-39x + 49x = -16 + 36$$
$$10x = 20$$
$$x = 2$$



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1.3 Solve the following linear equations. [4.2.1.8; 4.2.1.9]

(i) $9x - 9 = 20x - 8 - 20x - 19$
 $9x - 20x + 20x = 9 - 8 - 19$
 $9x = -18$
 $x = -2$

(j) $6y + 15 - 10y + 30 = -15y + 23$
 $6y - 10y + 15y = -15 - 30 + 23$
 $11y = -22$
 $y = -2$

(k) $2r + 61 = 7r + 7 - 11r - 12$
 $2r - 7r + 11r = -61 + 7 - 12$
 $6r = -66$
 $r = -11$

1.4 Solve the following linear equations. [4.2.2.2; 4.2.2.3]

(l) $-2(6y - 6) = 5(-3y + 2) - 13$
 $-12y + 12 = -15y + 10 - 13$
 $-12y + 15y = -12 + 10 - 13$
 $3y = -15$
 $y = -5$

(m) $-4(-6f - 3) - 2 = 2(11f - 5)$
 $24f + 12 - 2 = 22f - 10$
 $24f - 22f = -12 + 2 - 10$
 $2f = -20$
 $f = -10$

(n) $5(4n + 2) = -5(3n + 7) + 5(9 + 5n) - 100$
 $20n + 10 = -15n - 35 + 45 + 25n - 100$
 $20n + 15n - 25n = -10 - 35 + 45 - 100$
 $10n = -100$
 $n = -10$

(o) $-7(-12m + 9) + 90 = -3(3m + 8) + 8(-6 + 13m)$
 $84m - 63 + 90 = -9m - 24 - 48 + 104m$
 $84m + 9m - 104m = 63 - 90 - 24 - 48$
 $-11m = -75$
 $m = \frac{75}{11}$



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1.5 Solve the following linear equations. [4.2.3.5; 4.2.3.6; 4.2.3.7; 4.2.4.3]

(p)

$$t + 2 = \frac{t - 3}{9}$$

$$9(t + 2) = t - 3$$

$$9t + 18 = t - 3$$

$$8t = -21$$

$$t = \frac{-21}{8}$$

(q)

$$12 - n = \frac{n + 12}{7}$$

$$7(12 - n) = n + 12$$

$$84 - 7n = n + 12$$

$$-7n - n = -84 + 12$$

$$-8n = -72$$

$$n = 9$$

(r)

$$-10 - x = \frac{x - 7}{10}$$

$$10(-10 - x) = x - 7$$

$$-100 - 10x = x - 7$$

$$-10x - x = 100 - 7$$

$$-11x = 93$$

$$x = \frac{-93}{11}$$



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(s)

$$\frac{8n+9}{5} = \frac{3n-8}{8}$$

$$8(8n+9) = 5(3n-8)$$

$$64n+72 = 15n-40$$

$$64n-15n = -72-40$$

$$49n = -112$$

$$n = \frac{-112}{49}$$

(t)

$$\frac{3}{4}\left(n - \frac{5}{3}\right) = -8 + 4n$$

$$3\left(n - \frac{5}{3}\right) = 4(-8 + 4n)$$

$$3n - 5 = -32 + 16n$$

$$3n - 16n = 5 - 32$$

$$-13n = -27$$

$$n = \frac{27}{13}$$

1.6 Solve the following linear equations. [4.2.3.9; 4.2.3.10]

(u)

$$\frac{e}{e-8} + \frac{3}{e^2-64} = 1$$

$$\frac{e}{e-8} + \frac{3}{(e+8)(e-8)} = 1$$

$$e(e+8) + 3 = (e+8)(e-8)$$

$$e^2 + 8e + 3 = e^2 - 64$$

$$8e = -3 - 64$$

$$8e = -67$$

$$e = \frac{-67}{8}$$



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(v)

$$\frac{8y-16}{y^2-6y-16} = \frac{y}{y-8} - \frac{y}{y+2}$$

$$\frac{8(y-2)}{(y-8)(y+2)} = \frac{y}{(y-8)} - \frac{y}{(y+2)}$$

$$8(y-2) = y(y+2) - y(y-8)$$

$$8y-16 = y^2+2y - y^2+8y$$

$$8y-2y-8y = 16$$

$$-2y = 16$$

$$y = -8$$

(w)

$$\frac{x}{x-6} - \frac{7}{x^2-6x} = 1$$

$$\frac{x}{x-6} - \frac{7}{x(x-6)} = 1$$

$$x^2-7 = x(x-6)$$

$$x^2-7 = x^2-6x$$

$$6x = 7$$

$$x = \frac{7}{6}$$

2. Solve quadratic equations by factorization. [4.2.5.1; 4.2.5.2; 4.2.5.3; 4.2.5.4; 4.2.5.5]

(a) $16h^2 = -18h$

$$16h^2 + 18h = 0$$

$$2h(8h + 9) = 0$$

$$2h = 0 \quad \text{or} \quad 8h + 9 = 0$$

$$h = 0$$

$$8h = -9$$

$$h = \frac{-9}{8}$$

(b) $d^2 - 169 = 0$

$$(d + 13)(d - 13) = 0$$

$$d = -13 \quad \text{or} \quad d = 13$$

(c) $5y^2 - 1125 = 0$

$$5y^2 = 1125$$



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$$y^2 = 225$$

$$y = \pm 15$$

(d) $3c^2 - 243 = 0$
 $3(c^2 - 81) = 0$
 $3(c + 9)(c - 9) = 0$
 $c = -9$ or $c = 9$

(e) $6x^2 - x - 1 = 0$
 $(3x + 2)(2x - 1) = 0$
 $3x = -2$ or $2x = 1$
 $x = \frac{-2}{3}$ or $x = \frac{1}{2}$

(f) $4g^2 = -6g - 2$
 $4g^2 + 6g + 2 = 0$
 $2(2g^2 + 3g + 1) = 0$
 $2(2g + 1)(g + 1) = 0$
 $2g = -1$ or $g = -1$
 $g = -\frac{1}{2}$

(g) $3w^3 - 192w = 0$
 $3w(w^2 - 64) = 0$
 $3w(w + 8)(w - 8) = 0$
 $3w = 0$ or $w + 8 = 0$ or $w - 8 = 0$
 $w = 0$ or $w = -8$ or $w = 8$