

Algebra Review Questions A

1 Simplify each of the following by collecting like terms:

(a) $4xy + 3xz - 6zy - 5zx + yx$

(b) $-2a + 4ab + a - 4ba$

(c) $3rst - 10str + 8ts - 5rt + 2st$

(d) $2pq - 4pr + qr - 2rq + 3qp$

(e) $5lmn - 6ml + 7lm + 8mnl - 4ln$

2 Simplify each of the following by collecting like terms and factorizing:

(a) $4xy + 3xz - 6zy - 5zx + yx$

(b) $3rst - 10str + 8ts - 5rt + 2st$

(c) $2pq - 4pr + qr - 2rq + 3qp$

(d) $5lmn - 6ml + 7lm + 8mnl - 4ln$

3 Expand the following and then refactorize where possible:

(a) $8x(y - z) + 2y(7x + z)$ (b) $(3a - b)(b - 3a) + b^2$

(c) $-3(w - 7[x - 8(3 - z)])$ (d) $\frac{2a - 3}{4b} + \frac{3a + 2}{6b}$

Algebra Review Questions B

1 Simplify each of the following:

(a) $3pq + 5pr - 2qr + qp - 6rp$

(b) $5l^2mn + 2nl^2m - 3mln^2 + l^2nm + 4n^2ml - nm^2$

(c) $w^4 \div w^{-a} \times w^{-b}$

(d)
$$\frac{(s^{\frac{1}{3}})^{\frac{3}{4}} \times (t^{\frac{1}{4}})^{-1} \div (s^{\frac{2}{7}})^{-\frac{7}{4}}}{(s^{-\frac{1}{4}})^{-1} \div (t^{\frac{1}{2}})^4}$$

2 Remove the brackets in each of the following:

(a) $-4x(2x - y)(3x + 2y)$

(b) $(a - 2b)(2a - 3b)(3a - 4b)$

(c) $-\{-2[x - 3(y - 4)] - 5(z + 6)\}$

Algebra Review Question C

1 Factorize the following:

(a) $18xy^3 - 8x^3y$

(c) $16x^2 - 24xy - 18x + 27y$

(e) $x^2 + 7x - 30$

(g) $x^2 + 10x + 25$

(b) $x^3 - 6x^2y - 2xy + 12y^2$

(d) $(x - 2y)^2 - (2x - y)^2$

(f) $4x^2 - 36$

(h) $3x^2 - 11x - 4$

Simultaneous Equations A

1 Solve the following linear equations:

(a) $2(x - 1) - 4(x + 2) = 3(x + 5) + (x - 1)$

(b) $\frac{x-1}{2} - \frac{x+1}{2} = 5 - \frac{x+2}{4}$

(c) $\frac{3}{x+2} - \frac{5}{x} = -\frac{2}{x-1}$

2 Solve the following pairs of simultaneous equations:

(a) $x - y = 2$ by elimination

$$2x + 3y = 9$$

(b) $4x + 2y = 10$ by substitution

$$3x - 5y = 1$$

3 Solve the following set of three equations in three unknowns:

$$x + y + z = 6$$

$$2x - y + 3z = 9$$

$$x + 2y - 3z = -4$$

4 Simplify and solve the following set of simultaneous equations:

$$2(x + 2y) - 3(x + 2z) - 4(y - 2z) = -1$$

$$3(2x - y) + 2(3y - 4z) - 5(3x - 2z) = -7$$

$$-(x - y) + (x - z) + (y + z) = -2$$

Simultaneous Equations B

1 Solve for x :

(a) $3(x - 1) + 2(3 - 2x) = 6(x + 4) - 7$

(b) $\frac{x - 2}{3} - \frac{3 - x}{2} = 1 + \frac{4 - 5x}{4}$

(c) $\frac{4}{x - 1} + \frac{2}{x + 1} = \frac{6}{x}$

2 Solve the following pair of simultaneous equations for x and y :

$$3x - 4y = 7$$

$$5x - 2y = 7$$

3 Solve the following set of three equations in three unknowns:

$$x - 2y + 3z = 10$$

$$3x - 2y + z = 2$$

$$4x + 5y + 2z = 29$$