

UNIT 22 Algebraic Concepts**CSEC Revision Test**

1. Simplify the following expressions:

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

(b) $x^2 + 4x + 2x^2 - 2x$ (2 marks)

2. Expand the following:

(a) $3(x + 3)$

(b) $4(x - 2y)$

(c) $x(1 - 2x)$ (3 marks)

3. Solve each of the following equations:

(a) $x + 3 = 5$

(b) $6 - x = 2x$

(c) $\frac{x}{4} = 3$

(d) $2x - 3 = 7$ (8 marks)

4. (a) The perimeter of a rectangle is given by

$$P = 2(L + B)$$

where L and B are the lengths of the sides.

Find P when $L = 17$ and $B = 13$. (2 marks)

(b) Solve the equation

$$4x - 5 = x + 1$$
 (3 marks)

5. A book of 20 postage stamps contains only 17 cent and 22 cent stamps. The total value of the stamps is \$4.

(a) There are n stamps at 22 cents.

(i) Write an expression, in terms of n , for the total value of the 22 cent stamps. (1 mark)

(ii) Write an expression, in terms of n , for the number of 17 cent stamps. (1 mark)

UNIT 22 Algebraic Concepts**CSEC Revision Test**

- (b) The number of 22 cent stamps,
- n
- , can be found by solving the equation:

$$22n + 17(20 - n) = 400$$

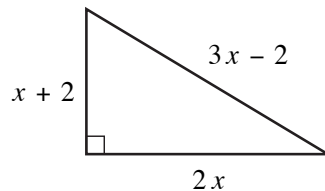
How many 22 cent stamps are in the book? (2 marks)

6. Pam earns x dollars, Ryan earns $(x + 60)$ dollars and Rufus earns $(x - 10)$ dollars. Together they earn a total of 530 dollars.

Calculate

- (a) the value of x
 (b) the amount Ryan earns. (5 marks)

7.



In the diagram above, *not drawn to scale*, the lengths, in cm, of the sides of the right-angled triangle are $x + 2$, $2x$ and $3x - 2$.

Write down, in its simplest form, an expression for

- (a) the perimeter of the triangle
 (b) the area of the triangle.

If the perimeter of the triangle is 24 cm, calculate

- (c) the value of x
 (d) the length of the longest side of the triangle. (6 marks)

8. (a) Simplify

$$\frac{x - 3}{3} + \frac{x + 2}{4}$$

- (b) Solve the equation

$$1 + 3(x - 1) = 4$$

- (c) Solve the equation

$$3(x - 2) = \frac{6}{5}$$

(6 marks)

UNIT 22 Algebraic Concepts**CSEC Revision Test**

9. (a) Simplify $\frac{1}{a+2} + \frac{1}{a-4}$ (2 marks)

(b) Simplify $\frac{x^2 - 9}{3x - 9}$ (3 marks)

10. (a) Simplify

(i) $3m - 2(m + 1)$

(ii) $\frac{3}{y} - \frac{2}{y-2}$

(b) Solve the equation

$$2(x - 1) = \frac{5}{2} \quad \begin{array}{l} (8 \text{ marks}) \\ (CXC) \end{array}$$

11. (a) Solve the equation

$$3x + 2 = 12 - 2x$$

(b) Simplify the expression

$$3(5x + 2) - 2(4x + 3) \quad \begin{array}{l} (6 \text{ marks}) \\ (CXC) \end{array}$$

(58 MARKS)

UNIT 22 Algebraic Concepts

CSEC Revision Test Answers

1. (a) $x + y$ (b) $3x^2 + 2x$ B1 B1 (2 marks)
2. (a) $3x + 9$ (b) $4x - 8y$ (c) $x - 2x^2$ B1 B1 B1 (3 marks)
3. (a) $x = 2$ (b) $x = 2$ (c) $x = 12$ B2 B2 B2
(d) $x = 5$ B2 (8 marks)
4. (a) $P = 2(17 + 13) = 60$ M1 A1
(b) $3x = 6, x = 2$ M2 A1 (5 marks)
5. (a) (i) $22n$ (ii) $(20 - n)$ B1 B1
(b) $5n = 60, n = 1$ M1 A1 (4 marks)
6. (a) $x + (x + 60) + (x - 10) = 530, x = 120$ M1 A1 B2
(b) \$180 B1 (5 marks)
7. (a) $6x$ (b) $x(x + 2)$ (c) 4 cm (d) 10 cm B1 B2 B2 B1 (6 marks)
8. (a) $\frac{7x - 6}{12}$ B2
(b) $x = 2$ B2
(c) $x = \frac{12}{5}$ B2 (6 marks)
9. (a) $\frac{2(a - 1)}{(a + 2)(a - 4)}$ B2
(b) $\frac{x^2 - 9}{3x - 9} = \frac{(x - 3)(x + 3)}{3(x - 3)} = \frac{x + 3}{3}$ M1 A1 A1 (5 marks)
10. (a) (i) $3m - 2m - 2 = m - 2$ M1 A1
(ii) $\frac{3(y - 2) - 2y}{y(y - 2)} = \frac{y - 6}{y(y - 2)}$ M1 A1 A1
(b) $x - 1 = \frac{5}{4}$ M1 A1
 $x = \frac{5}{4} + 1 = \frac{9}{4}$ A1 (8 marks)
11. (a) $3x + 2x = 12 - 2$ M1 A1
 $5x = 10$
 $x = 5$ A1
(b) $15x + 6 - 8x - 6$ M1 A1
 $= 7x$ A1 (6 marks)

(TOTAL MARKS 58)