

UNIT 23 *Algebraic Manipulation***CSEC Revision Test**

1. Expand the following:

(a) $3(x + 3)$

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

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

(3 marks)

2. (a) Multiply out and simplify

$$(x + a)(x - a)$$

(2 marks)

(b) Show how you can use part (a) to find the exact value of

$$873^2 - 127^2$$

(2 marks)

3. Solve $3x + y = 4$

$$y = x + 2$$

(3 marks)

4. (a) Solve the simultaneous equations

$$3d + 2c = 425$$

$$d + c = 160$$

(3 marks)

(b) The cost of 3 juice drinks and 2 packets of plantain chips is \$4.25.

The cost of 1 juice drink and 1 packet of chips is \$1.60.

Find the cost of 3 drinks and 1 packet of chips.

(1 marks)

5. Solve these simultaneous equations.

$$5x + y = 17$$

$$4x - 2y = 15$$

(4 marks)

6. Solve simultaneously

$$3x + y = 2$$

$$4x + 3y = 3$$

(CXC)

(5 marks)

7. Solve the simultaneous equations

$$3x - y = 10$$

$$2x + y = 5$$

(CXC)

(5 marks)

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8. Factorise completely

(a) $4x^2 - 9$

(b) $mp + mq + np - nq$

(c) $2x^2 + 3xy + y^2$

(CXC)
(6 marks)

9. Factorise completely

(a) $p^3 - p$

(b) $6nx - 9mx - 4ny + 6my$

(CXC)
(4 marks)

10. Expand and simplify

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

(CXC)
(2 marks)

(40 MARKS)

UNIT 23 Algebraic Manipulation

CSEC Revision Test Answers

- | | | | | |
|--|---------------|--|----------|-----------|
| 1. (a) $3x + 9$ | (b) $4x - 8y$ | (c) $x - 2x^2$ | B1 B1 B1 | (3 marks) |
| 2. (a) $(x + a)(x - a) = x^2 + ax - ax - a^2$ | | | M1 | |
| | | $= x^2 - a^2$ | A1 | |
| (b) $x = 873, a = 127$ | | | M1 | |
| | | $873^2 - 127^2 = (873 + 127)(873 - 127)$ | | |
| | | $= 1000 \times 746$ | | |
| | | $= 746000$ | A1 | (4 marks) |
| 3. $3x + (x + 2) = 4$ | | | M1 | |
| $4x = 2 \Rightarrow x = 0.5, y = 2.5$ | | | A1 A1 | (3 marks) |
| 4. (a) $d = 105, c = 55$ | | | M1 A1 A1 | |
| (b) $3 \times 1.05 + 1 \times 0.55 = \3.70 | | | B1 | (4 marks) |
| 5. $10x + 2y = 34$ | | | M1 | |
| $4x - 2y = 15$ | | | | |
| $14x = 49$ | | | A1 | |
| $x = \frac{49}{14} = \frac{7}{2}, y = 17 - \left(5 \times \frac{7}{2}\right) = -\frac{1}{2}$ | | | A1 A1 | (4 marks) |
| 6. $9x + 3y = 6$ | | | M1 | |
| $4x + 3y = 3$ | | | A1 | |
| $5x = 3 \Rightarrow x = \frac{3}{5}$ | | | A1 | |
| $y = 2 - 3 \times \frac{3}{5} = \frac{1}{5}$ | | | M1 A1 | (5 marks) |
| 7. $3x - y = 10$ | | | M1 | |
| $2x + y = 5$ | | | | |
| $5x = 15 \Rightarrow x = 3$ | | | A1 A1 | |
| $y = 5 - 2 \times 3 = -1$ | | | M1 A1 | (5 marks) |
| 8. (a) $(2x - 3)(2x + 3)$ | | | M1 A1 | |
| (b) $(m - n)(p + q)$ | | | M1 A1 | |
| (c) $(2x + y)(x + y)$ | | | M1 A1 | (6 marks) |
| 9. (a) $p(p^2 - 1) = p(p - 1)(p + 1)$ | | | M1 A1 | |
| (b) $3x(2n - 3m) - 2y(2n - 3m)$ | | | | |
| $= (3x - 2y)(2n - 3m)$ | | | M1 A1 | (4 marks) |
| 10. $6x^2 + 7x - 20$ | | | M1 A1 | (2 marks) |

(TOTAL MARKS 40)