

UNIT 21 *Formulae***CSEC Revision Test**

Questions 1-12 (CXC)

1. Given $a = 2$, $b = -3$ and $c = 0$, evaluate
- (a) $2ab - 3bc$
- (b) b^a (3 marks)
2. If $p = 3$ and $q = -2$, calculate the value of $4p + 5q$. (2 marks)
3. Given that $x = 2$ and $y = -3$, calculate the value of xy^2 . (2 marks)
4. Given that $m = 3$ and $n = -2$, calculate the value of
- (a) mn^2
- (b) $(m + n)(m - n)$ (5 marks)
5. (a) Given that $f * g = f + g^2$, calculate the value of $5 * 2$. (2 marks)
- (b) Write down an expression for the TOTAL cost, in dollars, of 8 metres of fabric at x dollars per metre and y reels of thread at 2 dollars per reel. (2 marks)
6. If $a * b = 2a - 5b$, calculate the value of
- (a) $3 * 2$ (1 mark)
- (b) $(3 * 2) * 1$ (2 marks)
7. If $l = -2$, $n = -3$ and $m = 4$, calculate the value of
- $$\frac{m + nl}{n - m}$$
- (2 marks)
8. Make t the subject of the formula
- $$\frac{p}{2} = \sqrt{\frac{t + r}{g}}$$
- (3 marks)
9. (a) Using the formula
- $$t = \sqrt{\frac{5m}{12n}}$$
- calculate the value of t when $m = 20$ and $n = 48$.
- (b) Express m as subject of the formula in (a) (i) above. (5 marks)

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10. (a) Make a the subject of the formula

$$b = \frac{3a + 2}{a + 3} \quad (2 \text{ marks})$$

- (b) Calculate the value of a when $b = 2$. (1 mark)

11. Given the formula

$$V = \pi r^2 h$$

rearrange the formula to make r the subject of the formula. (2 marks)

12. (a) Make y the subject of the formula,

$$\sqrt{\frac{ym}{t}} = 3b \quad (3 \text{ marks})$$

- (b) The width, (w), of a rectangular lawn is 3 metres less than half its length (l).
The perimeter is 42 metres.

(i) Show that $w + l = 21$. (1 mark)

(ii) Write an equation for the width, w , in terms of the length, l . (1 mark)

(iii) Calculate in metres the width, (w), of the lawn. (3 marks)

13. The cost, J\$ C , of advertising in the local newspaper is worked out using the formula

$$C = 20n + 30$$

where n is the number of words in the advertisement.

- (a) Annelise puts in an advertisement of 15 words.

Work out the cost. (2 marks)

- (b) The cost of Debbie's advertisement is J\$250.

(i) Use the formula to write down an equation in n . (1 mark)

(ii) Solve the equation to find the number of words in Debbie's advertisement. (2 marks)

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14. The heat setting of a gas oven is called its Gas Mark.

A Gas Mark, G , may be converted to a temperature, F , in degrees Fahrenheit, using the formula

$$F = 25G + 250$$

(a) Factorise completely $25G + 250$. (1 mark)

A Gas Mark may be converted to a temperature, C , in degrees Celsius, using the formula

$$C = 14G + 121$$

(b) Make G the subject of the formula $C = 14G + 121$. (2 marks)

(TOTAL MARKS 50)

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1. (a) -12 (b) 9 B2 B1 (3 marks)
2. $4 \times 3 + 5 \times (-2) = 2$ M1 A1 (2 marks)
3. $2 \times (-3)^2 = 18$ M1 A1 (2 marks)
4. (a) $3 \times (-2)^2 = 12$ M1 A1
- (b) $n(3 + (-2))(3 - (-2)) = 1 \times 5 = 5$ M1 A1 A1 (5 marks)
5. (a) $5 + 2^2 = 9$ M1 A1
- (b) $T = 8x + 2y$ M1 A1 (4 marks)
6. (a) $2 \times 3 - 5 \times 2 = -4$ B1
- (b) $2 \times (-4) - 5 \times 2 = -18$ M1 A1 (3 marks)
7. $\frac{4 + (-3) \times (-2)}{-3 - 4} = \frac{10}{(-7)} = -\frac{10}{7}$ M1 A1 (2 marks)
8. $\left(\frac{p}{2}\right)^2 = \frac{t+r}{g}$ M1
- $t+r = \frac{gp^2}{4}$ A1
- $t = \frac{gp^2}{4} - r$ A1 (3 marks)
9. (a) $t = \sqrt{\frac{5 \times 20}{12 \times 48}} = \frac{5}{12}$ M1 A1
- (b) $t^2 = \frac{5m}{12n}$ M1
- $m = \frac{12nt^2}{5}$ A1 (5 marks)
10. (a) $b(a+3) = 3a+2$
- $ba - 3a = 2 - 3b$ M1
- $a(b-3) = 2 - 3b$
- $a = \frac{2-3b}{b-3}$ A1
- (b) $a = 4$ B1 (3 marks)

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11. $r^2 = \frac{V}{\pi h}$ M1
- $r = \sqrt{\frac{V}{\pi h}}$ A1 (2 marks)
12. (a) $\frac{ym}{t} = 9b^2$ M1
- $ym = 9b^2t$ A1
- $y = \frac{9b^2t}{m}$ A1
- (b) (i) $2w + 2l = 42, w + l = 21$ B1
- (ii) $w = 21 - l$ or $w = \frac{l}{2} - 3$ B1
- (iii) $2w = (21 - w) - 6$ M1
- $3w = 15$ A1
- $w = 5$ A1 (8 marks)
13. (a) J\$330 (b) (i) $250 = 20n + 30$ (ii) 11 M1 A1 B1 M1 A1
(5 marks)
14. (a) $25(G + 10)$ (b) $G = \frac{C - 121}{14}$ B1 B2 (3 marks)

(TOTAL MARKS 50)