XT - MATHS Grade 12

Name: _____ **Class:** _____

Subject: Calculus 1: Factor Theorem **Date:** _____

Total Marks: 76

Question 1: True/False [8] Mathematics - LO 2 : AS 4

$f(x) = 2x^3 - 9x^2 + 16x - 12$

The only real root of $f(x)$ is $x = 2$.

TRUE	FALSE

Question 2: True/False [8] Mathematics - LO 2 : AS 4

$f(x) = x^3 - 8x^2 + 5x + 14$

If $f(x) = 0$, then x will be equal to 2 or 7.

TRUE	FALSE

Question 3: Multiple Choice [2] Mathematics - LO 2 : AS 4

$f(x) = x^2 - x$ divided by $x + 1$ leaves a remainder of ...

A	2
B	-2
C	0
D	6

Question 4: Multiple Choice [4]

$f(x) = x^3 + 2x^2 - 3x - 3$

The number p which must be added to $f(x)$ so that $f(x) + p$ is exactly divisible by $(2x - 1)$ is ...

A	$3\frac{7}{8}$
B	$-3\frac{7}{8}$
C	$3\frac{3}{8}$
D	$-3\frac{3}{8}$
E	$4\frac{1}{8}$

Question 5: Multiple Choice [6] Mathematics - LO 2 : AS 4

If $x - 2$ is a factor of $f(x) = x^3 - 12x^2 + 44x - 48$,
what is the solution of $f(x) = 0$?

A	$x = 2;\ x = 4;\ x = 6$
B	$x = 2;\ x = 3;\ x = 4$
C	$x = -2;\ x = -4;\ x = -6$
D	$x = -2;\ x = -4;\ x = 18$

Question 6: True/False [2] Mathematics - LO 2 : AS 4

If $f(x)$ is a polynomial of the 3^{rd} degree and
$f(x) = (2x + 3).Q(x) + 7$, then $f(x) - 7$ will be divisible by $(2x + 3)$.

TRUE **FALSE**

Question 7: True/False [3] Mathematics - LO 2 : AS 4

$(x + 2)$ is a factor of $x^3 + 8x^2 + 17x + 10$.

TRUE **FALSE**

Question 8: Socrates [8] Mathematics - LO 2 : AS 4

If ***f(x) = x³ + ax² - 7x + b*** and ***g(x) = x² + x - 2*** , then ***a = ...*** and ***b = ...***
Type in the two answers in order, separated by a ;

Question 9: Socrates [4] Mathematics - LO 2 : AS 4

$f(x) = x^3 + (k - 4)x^2 + (k - 9)x - 4$

If $f(x)$ divided by $(x - 2)$ gives a remainder of 12, then the value of k will be ...
Type the number only.

Question 10: Socrates [4] Mathematics - LO 2 : AS 4

$f(x) = 12x^3 + mx^2 + 10x - 8$
If $2x + 1$ is a factor of $f(x)$, then m = ...
Type the number only.

Question 11: Socrates [3] Mathematics - LO 2 : AS 4

When $f(x) = 2x^3 - 7x^2 - 3x + 20$ is divided by $2x + 3$, the remainder is ...
Type the number only.

Question 12: Cloze [4] Mathematics - LO 2 : AS 4

$f(x) = x^3 - 2x^2 - 2x + 7$

If $f(x)$ is divided by $(x - a)$ and it leaves no remainder, then (Ans. 1).
If $f(x)$ is divided by $(x - 2)$ and the remainder is 3, then (Ans. 2).
When $f(x)$ is divided by $(2x - 1)$, then the remainder is equal to (Ans. 3).

1	
2	
3	

- $f(2) = 3$
- $f(-3) = 2$
- $f(a) = 0$
- $f(-2) = 3$
- $f(-a) = 0$
- $5\frac{5}{8}$
- $6\frac{1}{6}$
- $-\frac{1}{2}$

Question 13: Cloze [6] Mathematics - LO 2 : AS 4

$f(y) = 8y^3 + 26y^2 - 23y + 4$ and $f(½) = 0$.
The three roots in ascending order are: (Ans. 1), (Ans. 2) and (Ans. 3).

1	
2	
3	

- $y = \frac{1}{2}$
- $y = -4$
- $y = \frac{1}{4}$
- $f = \frac{1}{2}$
- $f = -4$
- $f = \frac{1}{4}$

Question 14: Cloze [10] Mathematics - LO 2 : AS 4

$f(x) = x^3 + m^2x^2 - 25x - 14m$
The value(s) of m for which $x + 1$ will be a factor of $f(x)$ is/are (Ans. 1).
The value(s) of m for which $x - 4$ will be a factor of $f(x)$ is/are (Ans. 2).
The value(s) of m for which the product of $x + 1$ and $x - 4$ will be a factor of $f(x)$ is/are (Ans. 3).

1	
2	
3	

- $m = 2;\ m = 12$
- $m = 2;\ m = -\frac{9}{8}$
- $m = 2;\quad m = 12;\quad m = -\frac{9}{8}$
- $m = 2$
- $m = -2;\ m = \frac{9}{8}$
- $m = -2;\ m = -12$

Question 15: Socrates [4] Mathematics - LO 2 : AS 4

Is $2x - 1$ a factor of $f(x) = 4x^3 + 2x^2 + 2x - 2$?
Type either Yes or No.

15 Questions, 3 Pages