SEKOLAH BUKIT SION

AY 2021-2022
MATHEMATICS 0580

CHAPTER TEST: DIFFERENTIATION

NAME: _____ **DATE:** _____
CLASS: _____ **SCORE:** _____/40

ANSWER ALL QUESTIONS. PROVIDE NECESSARY WORKING.

QUESTION 01 **[13 marks]**

Write down the first and second derivatives of each of the following functions.

FUNCTION	**FIRST Derivative**	**SECOND Derivative**
(a) $y = 3x - 5$		
(b) $y = 5x^2 - 8x + 2$		
(c) $y = 2x^3 - 6x^2 + 4x - 7$		
(d) $y = x(3x^3 - 5)$		
(e) $y = \frac{2}{5}x^{10} - \frac{1}{2}x^8 - 6$		
(f) $y = (x^2 + 5)(2x^3 - 3)$		

QUESTION 02 **[3 marks]**

Find the coordinates of the point on the curve $y = 2x^2 - 5x + 1$ at which the gradient is 3.

QUESTION 03 **[3 marks]**

Write down the equation of the tangent to $y = 4x^2 - 11x + 5$ at $x = 4$.

QUESTION 04 **[5 marks]**

The function $f(x) = x^3 + px^2 + qx + r$ has a minimum point (3, -2) and a maximum value at $x = -1$.
Find the values of p, q and r.

QUESTION 05 **[6 marks]**

Find the stationary point/s of $y = 4x^2 - 20x + 25$ and determine the nature of its stationary point/s using the first derivative test method.

QUESTION 06 **[10 marks]**

(a) Find the coordinates of the stationary point/s of $y = 15x^2 - 2x^3$.
(b) Determine the nature of its stationary point/s using the second derivative test.
(c) Write down the range of values of x for which y is an increasing function.