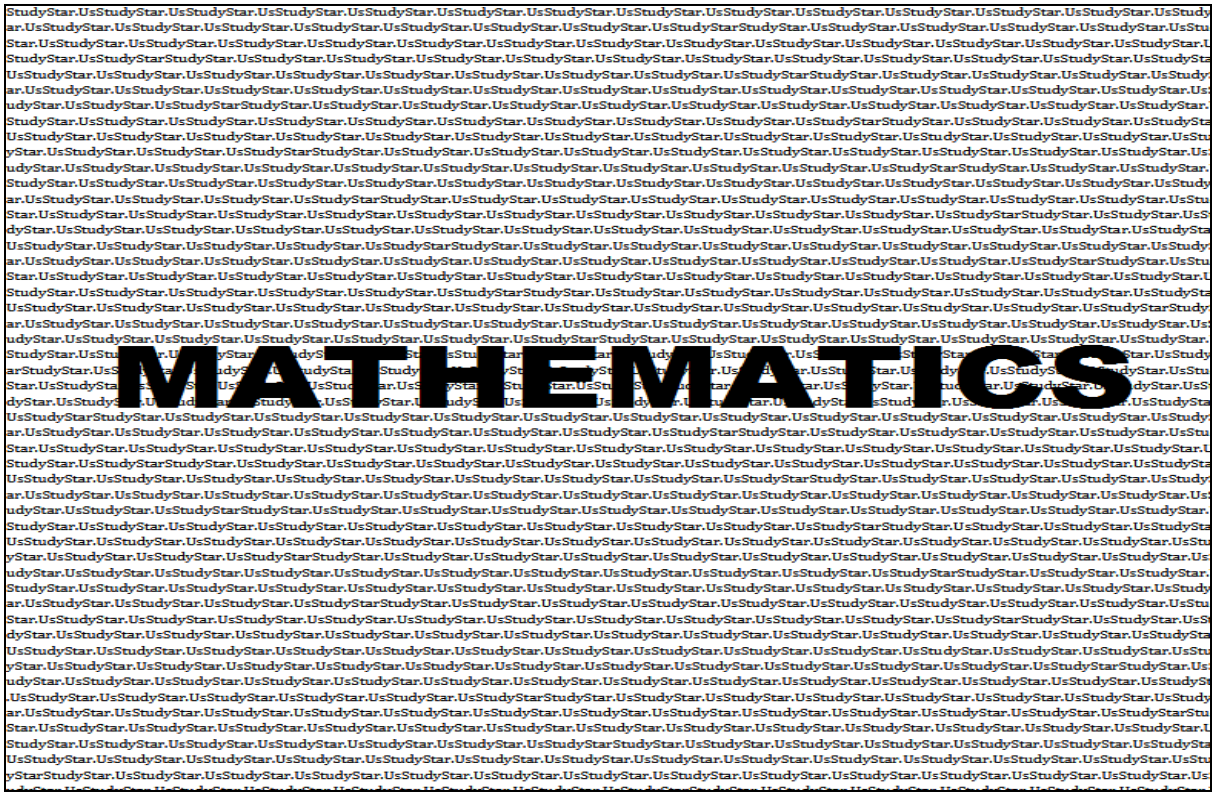

DIFFERENTIATION

Total Marks: 38

Duration: 0 hours, 40 minutes

Instructions to test takers

1. Answer all the questions in this paper
2. All the answers for the questions in this paper will be found on **Study Star** (www.studystar.me)
3. Using the answers on the website, mark yourself truthfully and carefully.

Turn this page, time yourself and begin the test

Section A

1. Differentiate $y = x^3 + 2x^2 - x + 1$ [2]

2. Differentiate $y = \frac{2}{x^2}$ [2]

3. Differentiate $y = 3x^2 + x - \frac{4}{x} + \frac{2}{x^2}$ [2]

4. Find the gradient of the curve $y = 7x + 2x^3$ at the point M(-2, 4). [3]

5. Find the equation of the tangent to the curve $y = 3x^2 - x$ at (2, 3). [3]

6. Find the equation of the normal to the curve $y = 3x^3 + 3x$ at the point (4, 5). [3]

7. Given that $y = 5x^2 - 2x$, find the coordinates of the stationary point. [3]

8. Differentiate $y = 2(4x - 1)^8$ [2]

9. Differentiate $y = 4x^2(2 - x)^3$ [2]

10. Differentiate $y = \frac{4x}{(3x+1)^5}$ [2]

Section B

11. Differentiate $y = x^3 + x^2 - 3(3x^2 + 1)^5$ [3]

12. Differentiate $y = (x - 1)^3(x^2 + 1)^3$ [3]

13. Differentiate $y = \frac{2x}{(x+1)^3}$ [3]

14. Find the gradient of the curve $y = (x - 1)(3 - 4x)^4$ at the point where $x = 0$. [4]

15. Find the coordinates of the stationary points of the curve $y = \frac{3}{(x+1)^2}$ at (3, -5). [4]

A top student's secret tool