

Roll# Student 1:

Roll# Evaluator 1:

Roll# Student 2:

Roll# Evaluator 2:

Problem 1 [25 Marks]

Differentiate the following functions.

a) $y = x^3 - 4x + 6$ [3 Marks]

e) $y = \log_2 x - \cot x$ [4 Marks]

b) $y = x + \sqrt{x}$ [3 Marks]

f) $y = \ln x - \log_5 x$ [4 Marks]

c) $y = 2^x$ [2 Marks]

g) $y = \cos x + 4x^2$ [3 Marks]

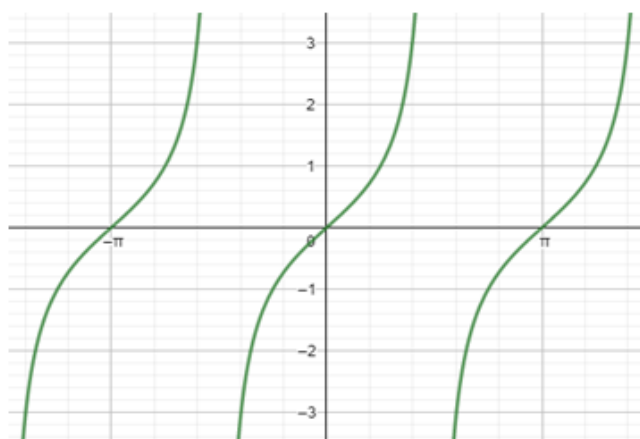
d) $y = 5^x + 6^x$ [3 Marks]

h) $y = 2 \csc x + 3 \sec x$ [3 Marks]

Problem 2 [20 Marks]

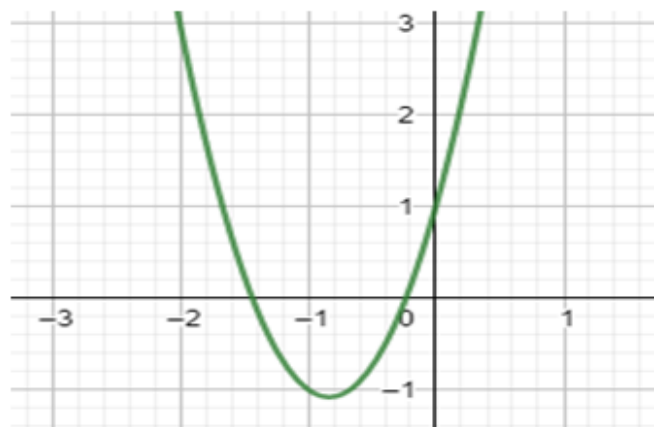
For the given graphs of $f(x)$ sketch the graphs of $f'(x)$, using the slope of the tangent at each point.

(a)



$$f(x) = \tan x$$

(b)



A quadratic function

Problem 3 [35 Marks]

Differentiate the following functions using product rule, quotient rule or chain rule.

a) $f(x) = (x - 2)(2x + 3)$ [5 Marks]

e) $f(x) = \sqrt{x^3 + 2x}$ [5 Marks]

b) $f(x) = x \ln(x) - x$ [5 Marks]

f) $f(x) = \tan(5 - \sin t)$ [5 Marks]

c) $f(x) = \frac{\cos x}{1 - \sin x}$ [5 Marks]

d) $f(x) = \frac{1 - xe^x}{x + e^x}$ [5 Marks]

g) $f(x) = e^{\sin \sqrt{x^3 + 2x}}$ [5 Marks]