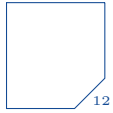




FORENAME:

SURNAME:

STUDENT NO:



2018–19 Autumn

MATH115 Basic Mathematics – Homework 3

N. Course

DEADLINE: Tuesday 23 October 2018, 3pm

Exercise 11 (Differentiation Rules).

(a) Find y'' if $y = 3x^7 - 7x^3 + 21x^2$.

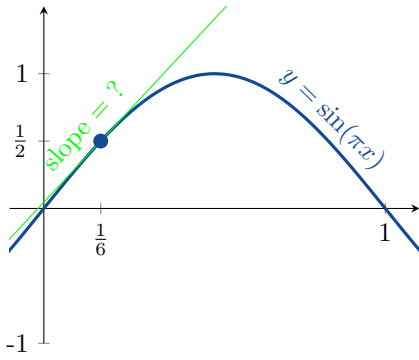
(b) Find $\frac{db}{dz}$ if $b = -2z^{-1} + \frac{4}{z^2}$.

Exercise 12 (Derivatives of Trigonometric Functions). Calculate the following derivatives. Simplify your answers.

(a) Find $\frac{dr}{d\theta}$ if $r = (1 + \sec \theta) \sin \theta$.

(b) Find $\frac{d^3}{dx^3} (-2 \sin x) \Big|_{x=\pi}$.

Exercise 13 (Slope of a Function). Find the slope of the graph $y = \sin(\pi x)$ at the point $(\frac{1}{6}, \frac{1}{2})$.



Exercise 14 (Differentiation Rules). Find $\frac{dy}{dx}$ if $y = \frac{x^2 + 3}{(x - 1)^3 + (x + 1)^3}$. (Please simplify your answer.)

Exercise 15 (The Chain Rule).

(a) Differentiate $y = (5 - 2x)^{-3} + \frac{1}{8} \left(\frac{2}{x} + 1 \right)^4$.

(b) Differentiate $p = \sqrt{3t + t \sin 3t}$.