KING SAUD UNIVERSITY

DEANSHIP OF THE FIRST YEAR COMMON

BASIC SCIENCES DEPARTMENT

MATH 101 HW # 4 / SECOND SEMESTER 1438-1439 Date: 12/04/2018

Question 1

10 Marks (2 each)

Find $\frac{dy}{dx}$ for following functions.

1. $y = \tan^{-1}(x^2)$
2. $y = \dfrac{1}{\sin^{-1} x}$
3. $y = \sec^{-1}\left(\sqrt{1+x^2}\right)$
4. $y = \left(\sec^{-1} x\right)^2$
5. $y = \tan^{-1}(\cos x)$

Answer:

Question 2 **6 Marks (2 + 2 + 2)**

Find y'' for following equations:

1. $x^2 + 3xy + y^2 = 2$
2. $\cos(xy) = 1$
3. $y = \tan^3 x^2$

Answer:

Question 3 **4 Marks**

Show that $f(x) = \sqrt{1+x}$ satisfies the conditions of the **Mean Value Theorem** on $[0, 8]$. Then find the numbers c that satisfies the conclusion of the theorem.

Answer:

Question 4

5 Marks

The position of a particle is given by the equation

$$s(t) = t^5 - 10t^2 + 1$$

where s in meters and t in seconds. Find the velocity of the particle when its acceleration is zero.

Answer:

Question 5

5 Marks

Find the absolute extrema of $f(x) = \sqrt[3]{x^2}$ on $[-1, 3]$.

Answer: