

**MATH 1500 A01**  
**Assignment #2**  
**Due: Tuesday, Oct. 21<sup>st</sup>**

1. (12 marks) Find the derivatives:

a)  $f(x) = \cos x + \frac{2}{x^2} + \sqrt[3]{x}$

b)  $g(t) = \frac{\sec^2 t}{t^3 + 1}$

c)  $p(r) = (r^2 + r + 1)(e^r + e^\pi)$

d)  $y = e^{\sqrt{1 + \tan(\sin x)}}$

2. (5 marks) Find all points on the graph of the function below at which the tangent line is horizontal.

$f(x) = 2 \sin x + \sin^2 x$  on  $[0, 2\pi]$

3. (3 marks) The function below describes the position of a particle moving in a straight line (t is in seconds, s is in meters). What is the velocity of the particle at t=5 seconds?

$s = t^3 + \frac{t^2}{2} + 2t + 2$