Full name(s): _____ .

Questions

1. What is the minimum and maximum value that the function $g(x) = x^2(x-2)$ takes on the interval $[0, 2]$?

2. Find the tangent line to the curve $y^2x + y = 1$ when $x = 3$ and $y = 5$.

3. Find the derivative of the function $h(x) = \frac{x\sin(x)}{1+\sqrt{x}}$.

4. compute the following limit:

$$\lim_{x \to 0^+} \sqrt{x}\ln(x) \tag{1}$$

5. A tank of liquid shaped like a cylinder of radius $r = 25$ cm is being filled at a rate of $5cm^3/s$. How fast is the height of the liquid changing?