Worksheet 4 / 15 points

Name: Section: 5 6 (circle one)

1. Use the intermediate value theorem to show that the equation $x^3 + 2x + 1 = 0$ has a solution in the interval $[-1, 0]$.

2. Find a value of b so that the function

$$f(x) = \begin{cases} x - b & x < 1 \\ bx^2 + 2 & x \geq 1 \end{cases}$$

is continuous on $(-\infty, \infty)$.

3. Using the definition of the derivative as a limit, find $f'(x)$ when $f(x) = \dfrac{1}{x^2 + 1}$.

4. let $h(x) = 3x^2 + 3\sqrt{x} + \dfrac{1}{\sqrt[3]{x}}$, find $h'(x)$.

5. Find $\dfrac{d}{dx}\Big((\sin(x))(5x^{2/3} + 7x^{1/7} + 15)\Big)$.

6. Find $\dfrac{d}{dt}\left(\dfrac{8\cos(t) + 2t}{7t^2 + 2t}\right)$

7. Let $g(x) = \dfrac{3\cos(x) + x^2\sin(x)}{4x^2 + 1}$, find $\dfrac{dg}{dx}$.

8. Let $W(x) = \left(\dfrac{\sin(x)}{x} + \sqrt{x} + 1\right)\Big(x^3 + x^2 + x + 1\Big)$. Find $W'(x)$.