

Name: _____ ID #: _____ Section: _____

Question 1 (3 points) Consider the function $f(x) = \sqrt{x} + x|x - 2|$.

- Find $f'_+(2)$ and $f'_-(2)$
- Find the domain of f and f'
- Find $f'(x)$ for all x in the domain of f' .

Question 2 (2.5 points) Consider the function

$$f(x) = \frac{e^{x+1}g(x)}{\sqrt{x}}.$$

If $g(1) = e^{-2}$, $g'(1) = 1$, find the value of $f'(1)$.

Question 3

- a) (2.2 points) Find an equation of the tangent line to the curve $y = x\sqrt{x}$ that is parallel to the line $y = 1 + 3x$.

- b) (2.3 points) Find an equation of the normal line to the given curve at the specified point:

$$y = \frac{2x}{x^2 + 1}, \quad (1,1)$$