Quiz

Directions: Carefully read each question below and answer to the best of your ability in the space provided. You MUST show your work to receive full credit!

1. Consider the function

$$f(x) = x^2 + 2x + 10.$$

(a) (5 points) Find the instantaneous rate of change of $f(x)$ when $x = 2$.

Solution: The instantaneous rate of change is given by the derivative,

$$f'(x) = 2x + 2.$$

We find the slope of the tangent line by evaluating $f'(x)$ at $x = 2$ to get

$$f'(2) = 2(2) + 2 = 6.$$

(b) (5 points) Find the value of x for which the tangent line to $y = f(x)$ has slope equal to 3.

Solution: We need to find x where the derivative of $f(x)$ is equal to 3. Hence, setting $f'(x)$ equal to 3, we obtain:

$$\begin{aligned} 2x + 2 &= 3 \\ 2x &= 1 \\ x &= \frac{1}{2}. \end{aligned}$$

Name: _____

Section (circle one): 021 022 023 024

Question:	1	Total
Points:	10	10
Score:		