

Mathematics 122

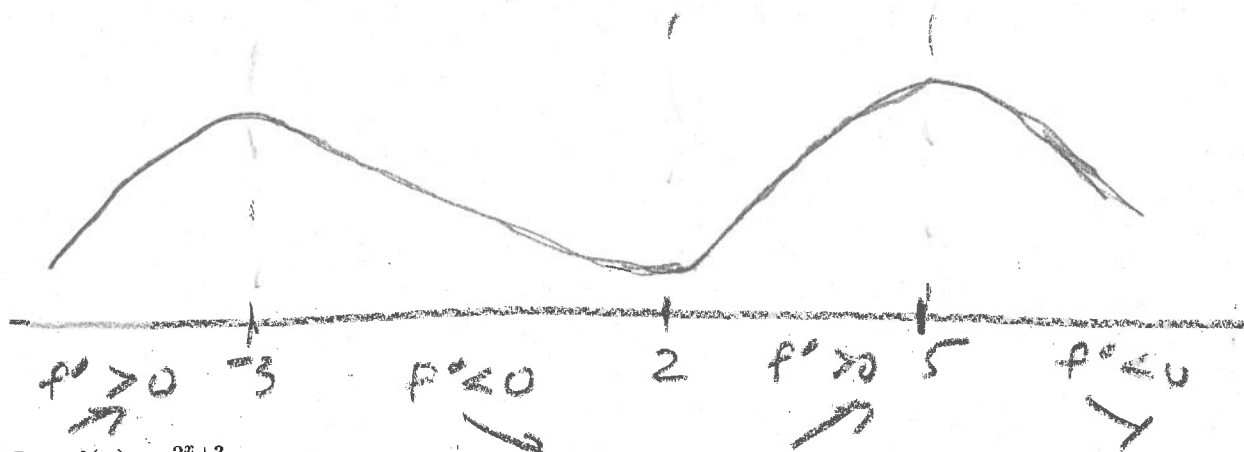
Quiz 8

Name: Key

You must show your work to get full credit.

1. Sketch a graph of a function with the following properties:

- (a) $f'(x) > 0$ when $x < -3$ or $2 < x < 5$,
 (b) $f'(x) < 0$ when $-3 < x < 2$ or $5 < x$.



2. Let $f(x) = \frac{2x+3}{x^2+1}$.

(a) Use your calculator to find $f(1.2)$.

$$f(1.2) = \frac{(2 \cdot 1.2 + 3)}{(1.2^2 + 1)} = \frac{2.4 + 3}{1.44 + 1} = \frac{5.4}{2.44} = 2.1711$$

(b) Use your calculator to find $f'(1.2)$

Math 8: n Deriv

$$f'(1.2) = -1.4828$$

$$\frac{d}{dx} \left(\frac{2x+3}{x^2+1} \right) \Big|_{x=1.2} = -1.4828$$

(c) Give the equation of the tangent line to the graph of $y = f(x)$ at the point where $x = 1.2$.

This is line through $(1.2, f(1.2)) = (1.2, 2.1711)$
 with slope $= f'(1.2) = -1.4828$
 So equation is

$$y = -1.4828(x - 2.1711)$$

or

$$y = -1.4828x + 3.2194$$