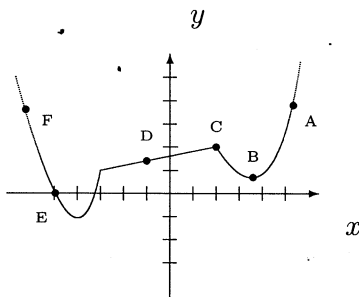


Math 171 - Quiz 5
September 26, 2018

Name key _____
Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (6 points) Consider the function f whose graph is shown below.



Referring to the labeled points, find a point at which

- (a) $f'(x) = 0$ B
- (b) $0 < f'(x) < 1$ D
- (c) $f'(x) > 1$ A
- (d) $f(x) = 0$ E
- (e) $f'(x) < 0$ E, F
- (f) $f'(x)$ is not defined C

2. (4 points) Let $f(x) = x^2 - 5x$. Use the limit definition of the derivative to compute $f'(3)$.

$$\begin{aligned}
 f'(x) &= \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} = \lim_{h \rightarrow 0} \frac{(x+h)^2 - 5(x+h) - x^2 + 5x}{h} \\
 &= \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 - 5x - 5h - x^2 + 5x}{h} \\
 &= \lim_{h \rightarrow 0} \frac{2xh + h^2 - 5h}{h} = \lim_{h \rightarrow 0} (2x + h - 5) \\
 &= 2x - 5 \quad \Rightarrow \quad f'(3) = 2(3) - 5 = 6 - 5 \\
 &= \boxed{1}
 \end{aligned}$$