

2.1 – 2.4 Day before Quiz Worksheet.

Non-Calculator Questions.

1. If $f(x) = \frac{3x^2 + x}{3x^2 - x}$, then $f'(x) =$

A) 1 B) $\frac{6x^2 + 1}{6x^2 - 1}$ C) $\frac{-6}{(3x - 1)^2}$ D) $\frac{-2x^2}{(x^2 - x)^2}$ E) $\frac{36x^3 - 2x}{(x^2 - x)^2}$

2. If the function f is continuous for all reals and if $f(x) = \frac{x^2 - 7x + 12}{x - 4}$
when $x \neq 4$, then $f(4) =$

A) 1 B) $\frac{8}{7}$ C) -1 D) 0 E) undefined

3. For a function $h(t)$ to be continuous at $t = c$, what three conditions must be met?

- 1.
- 2.
- 3.

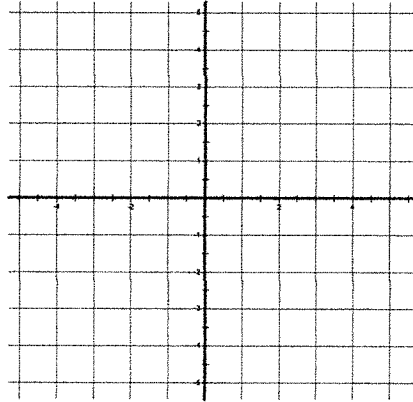
4. Given $f(\theta) = \cos 2\theta$, $\left[0, \frac{\pi}{6}\right]$.

- a) Find the average rate of change over the interval.
- b) Find the instantaneous rate of change at $\theta = \frac{\pi}{12}$.
- c) Write the equation of the line tangent to $f(\theta)$ at $\theta = \frac{\pi}{12}$.

5. Given $k(x) = \frac{1}{x}$

- a) Write the equation of the line tangent to $k(x)$
that goes through the point $\left(\frac{1}{2}, 2\right)$.

- b) Sketch both $k(x)$ and the tangent line.



Graphing Calculator Question.

6. Given $s(t) = -16t^2 + v_0t + s_0$ for free falling objects. A silver dollar is dropped from the top of a building that is 1362 feet tall.

- a) Determine the position and velocity functions for the coin.
- b) Determine the average velocity on the interval $[1, 2]$.
- c) Find the instantaneous velocities when $t = 1$ and $t = 2$.
- d) Find the time required for the coin to reach ground level.
- e) Find the velocity at impact.