

Name _____

Calculus Test #5 Review

1NC. Find $f'(x)$ for
 $f(x) = 7x^2 - 5x$.

2NC. Find the equation of the line tangent to the graph of $y = 3 - 2x^2$ at the point $(1, 1)$.

3NC. Find the x-coordinate(s) of all points on the graph of $y = x^3 + 2x^2 - 4x + 5$ at which the tangent line is horizontal.

4NC. If $g(x) = x^{-\frac{1}{5}}$, then find $g'(x)$ at $(32, \frac{1}{2})$.

5 NC. An equation of a line tangent to the parabola $y = 3 - 4x - x^2$ and containing the point $(1,2)$ is

6 NC. Find the derivative:
 $f(x) = \frac{x^3 + 3x + 2}{x^2 - 1}$.

- a) $2x + y - 4 = 0$
- b) $x - 2y + 3 = 0$
- c) $3x + y - 5 = 0$
- d) $2x - 3y + 4 = 0$
- e) none of these

7 NC. Find the derivative:
 $y = x \sin x + \cos x$

8 NC. Find $f'(x)$ for
 $f(x) = (x-1)(x^2-2)$

9 NC. Find $\frac{dy}{dx}$ for $y = \frac{3x}{x^2 + 1}$.

10 NC. If $f(2) = 3$ and $f'(2) = -1$, find an equation of the tangent line when $x = 2$.

- a) $y - 3 = 2(x + 1)$
- b) $y - 2 = 3(x + 1)$
- c) $y - 3 = -1(x - 2)$
- d) $y + 1 = 2(x - 2)$
- e) None of these

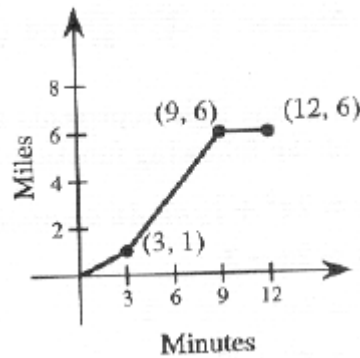
11 NC. Differentiate: $x^2 f(x)$

- a) $x[xf'(x) + 2f(x)]$
- b) $2xf'(x)$
- c) $x[xf(x) + 2f'(x)]$
- d) $x^2 f'(x)$
- e) None of these

12 NC. If $f'(x) = 5x^2 + 9x + 8$, then find $f''(x)$.

13 NC. Suppose the position equation for a moving object is given by $s(t) = 3t^2 - 2t + 5$ where s is measured in meters and t is measured in seconds. Find the velocity of the object when $t = 2$.

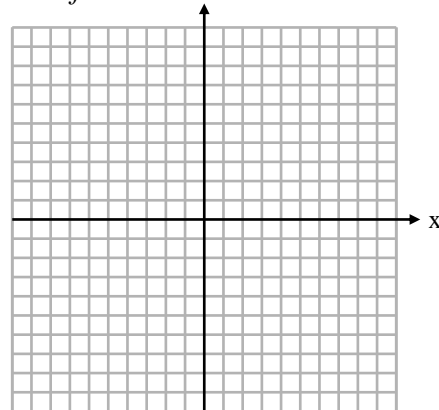
14 NC. The given graph of a position function represents the distance in miles that a person drives during a 12 minute drive to school. Make a sketch of the corresponding velocity function.



15 NC. Find the zeroes, horizontal, and vertical asymptotes of the function $y = \frac{3x - 1}{2x + 5}$.

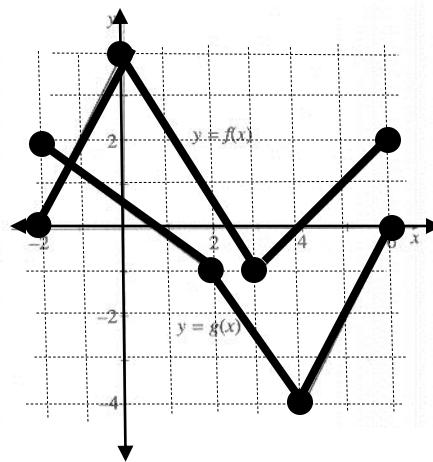
16 NC. Let $g(x) = -7f(x)$ and let $f'(x) = -9$. Find $g'(-7)$.

17 C. Consider $f(x) = x^3 + 3x^2$. Use your calculator and graph f and f' on the same set of coordinate axes. Describe the values of f at those values of x that are zeros of f' .



18 NC. f and g are functions whose graphs are given below. Let

$v(x) = \frac{f(x)}{g(x)}$. Using the picture at the right, find $v'(-1)$.



19C.

A coin is dropped from a height of 750 ft. The height, s (measured in feet), at time t (measured in seconds) is given, by

$$s = -16t^2 + 750.$$

A. Find the average velocity on the interval from $[1, 3]$.

B. Find the instantaneous velocity when $t = 3$.

C. How long does it take for the coin to hit the ground?

D. Find the velocity of the coin when it hits the ground.