

Pre-calculus Mid-chapter Practice Test

Find the average rate of change of $f(x)$ between a and b .

1. $f(x) = -5x^2 + 7$; $a = 5$, $b = 8$
- | | |
|--------|----------|
| a. -65 | c. -0.02 |
| b. -74 | d. 2.65 |

Find the equation of the secant of $f(x)$ through the points a and b .

2. $f(x) = -3x^2 - 9$; $a = -4$, $b = -2$
- | | |
|-------------------|-------------------|
| a. $y = 18x + 15$ | c. $y = 18x - 21$ |
| b. $y = 18x + 70$ | d. $y = 18x + 32$ |

3. Write the information that you would enter into a TI-89 graphing calculator that would allow you to find the answer to the question: What is the equation of the line that is tangent to the function $\frac{1}{x-3}$ at the point $(4,1)$?

4. Find the remainder when $f(x) = x^8 - 3x^6 - 3x^5$ is divided by $x - 2$.
- | | |
|--------|--------|
| a. -32 | c. 160 |
| b. 2 | d. -2 |
5. Expand $f(x) = x^2 - 11x + 20$ in terms of $x - 3$.
- | | |
|--------------------------------|--------------------------------|
| a. $(x - 3)^2 - 5(x - 3) - 4$ | c. $(x - 3)^2 - 4(x - 3) - 5$ |
| b. $-(x - 3)^2 + 5(x - 3) + 4$ | d. $-(x - 3)^2 + 4(x - 3) + 5$ |

Find the slope of the tangent to $f(x)$ at the given point for 6 and 7.

6. $f(x) = x^2 - 4$ at $(-3, 5)$
- | | |
|-------|-------|
| a. -6 | c. -8 |
| b. -4 | d. -2 |
7. $f(x) = \frac{1}{x}$ at $(3, 0.3333)$
- | | |
|------------|------------|
| a. -0.1111 | c. -0.3333 |
| b. 0.1111 | d. 0.3333 |

8. An object's height is represented by the function $f(t) = -16t^2 + 80$. Determine its average velocity from the time interval of $t = 0$ to $t = 2$.

9. Determine the object's exact velocity at $t = 2$.

Find the equation of the tangent to $f(x)$ at the given point.

10. $f(x) = -x^3 + 5x^2 + 3x - 6$ at $(-1, -3)$
- a. $y = -10x - 13$
 - b. $y = 3x + 0$
 - c. $y = 10x + 7$
 - d. $y = -29x - 32$

11. $f(x) = \frac{1}{x^2}$ at $(-5, 0.04)$
- a. $y = 0.016x + 0.12$
 - b. $y = -0.008x + 0.12$
 - c. $y = -0.04x - 0.16$
 - d. $y = 0.04x + 0.24$

Find the vertical asymptote of the graph of $f(x)$.

12. $f(x) = \frac{-2x^2 + 8x + 10}{x^2 - 6x + 5}$
- a. 5
 - b. 1
 - c. -2
 - d. 2

Find the hole in the graph of $f(x)$.

13. $f(x) = \frac{-x^2 + 2x + 3}{x^2 - 5x + 6}$
- a. 3
 - b. 2
 - c. -1
 - d. 1

Find the horizontal asymptote of the graph of $f(x)$.

14. $f(x) = \frac{3x^2 + 6x + 3}{x^2 + 3x + 2}$
- a. -1
 - b. -2
 - c. 3
 - d. -3

Find the limit of $f(x)$ as $x \rightarrow \infty$.

15. $f(x) = \frac{2x^2 - 7x + 5}{x^2 + 4x - 5}$
- a. 1
 - b. -5
 - c. 2
 - d. 5

16. Graph the following rational functions.

$$f(x) = \frac{x + 2}{x^2 - 4}$$

