

Ch 15 A Derivatives TEST REVIEW

Name _____

Advanced Math

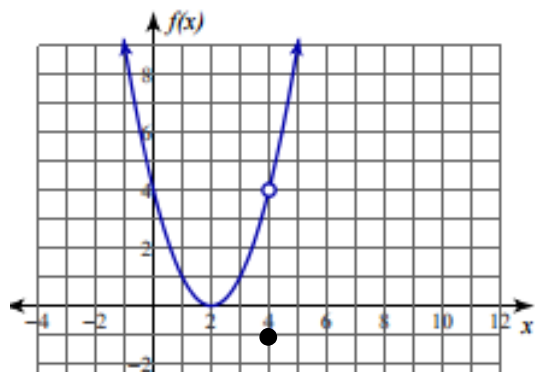
Evaluate the following.

1. $\lim_{x \rightarrow -3} \frac{x - 3}{x^2 + 2x + 2}$

2. $\lim_{x \rightarrow -4} \frac{x + 4}{x^2 + 5x + 4}$

3. $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$

4. Use the graph below to evaluate the following. Find $f(4) =$



$\lim_{x \rightarrow 4} f(x)$

5. Use the **limit definition** of the derivative to find the derivative of each function with respect to x .

a. $y = 4x^2 + 4$

b. $f(x) = 4x^2 + 4x - 3$

6. a. Find the average rate of change for the function $y = -x^2 + x + 2$ at -2 and 1.

b. Find the instantaneous velocity at $x = 3$.

c. Find the instantaneous acceleration at $x = 3$.

Find the equation of the tangent line of the function at the given value.

a) $y = x^3 - 3x^2 + 2$ at $x = 3$.

b) $y = -\frac{5}{x^2 + 1}$ at $x = -2$.

Find the derivative of the following.

a) $y = 5x^7 + 4x$

b) $y = -2x^3 - 4x^{-3}$

c) $y = \frac{5}{4}x^{\frac{2}{3}}$

d) $y = \frac{2}{2x^4 - 5}$

e) $y = (-2x^4 + 5x^2 + 4)(-3x^2 + 2)$

f) $y = \frac{3\sin x}{(2x + 5)}$

g) $y = (5x^2 + 3)^4$

h) $f(x) = \sin 2x^3$

i) $y = \ln x^3$

j) $f(x) = \sqrt{-2x^2 + 1}$