

Calculus Test Practice

Determine the limit of a function using a graph

Know the difference between a limit of a function and a value of the function

Find the limit of a function algebraically

Calculate the derivative of a function using the difference quotient

Find the derivatives of various functions

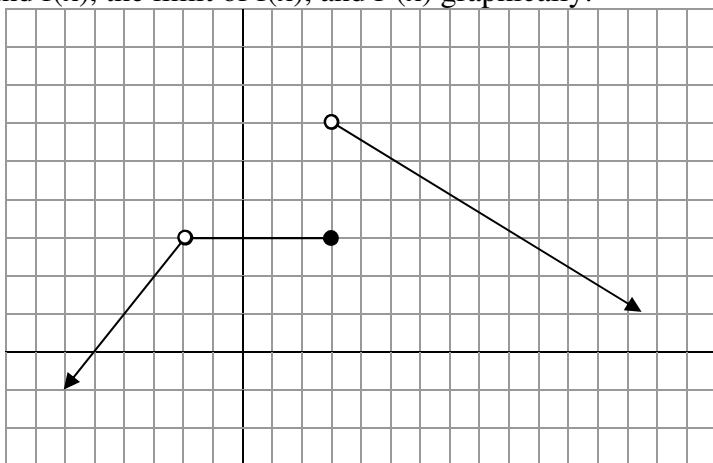
Find the slope of a line at a point by taking a derivative

Determine where the slope of a tangent line equals zero

Use the product rule and quotient rule

Use the chain rule

1. Find $f(x)$, the limit of $f(x)$, and $f'(x)$ graphically.



a. $f(1) =$

b. $f(3) =$

c. $f(0) =$

d. $f(-2) =$

e. $\lim_{x \rightarrow 1} f(x)$

f. $\lim_{x \rightarrow -2} f(x)$

g. $\lim_{x \rightarrow 3} f(x)$

h. $f'(0) =$

i. $f'(6) =$

2. Find the limit, if it exists.

a. $\lim_{x \rightarrow 3} 4x - 1$

b. $\lim_{x \rightarrow 5} 3x^2 + x$

c. $\lim_{x \rightarrow 3} \frac{x^2 - 7x + 12}{x^2 - 6x + 9}$

3. Find the derivative of the function by taking the limit of the difference quotient. $\frac{f(x+h) - f(x)}{h}$
 $f(x) = 5x + 3$

4. Find the derivative of the function by taking the limit of the difference quotient. $\frac{f(x+h) - f(x)}{h}$
 $f(x) = 3x^2$

5. Find the derivative of each function.

a. $y = x$

g. $h(x) = \sqrt[3]{x}$

b. $f(x) = 12$

h. $y = \frac{2}{x^3}$

c. $g(x) = x^{11}$

i. $f(x) = 2e^x$

d. $y = (x^2 + 4)(x - 3)$

j. $y = 3 \ln x$

e. $f(x) = \frac{x+7}{3x}$

k. $g(x) = 7^x$

f. $g(x) = 8x^3 - 5x^2 + 2x - 11$

6. Find the slope of the tangent line to the function at $x = 1$. $f(x) = \frac{1}{2}x^2 - 4x$

7. Find the equation of the tangent line to the function at $x = 2$ $f(x) = x^3 - 2$

8. Find the derivative of each function.

a. $y = (x^3 - 4)(3x^2 + 1)$

b. $f(x) = \frac{5x-2}{3x+1}$

c. $g(x) = (4x^3 - x^2)^4$

d. $y = \ln(x^2 + 1)$