

## Numerical Derivatives Activity

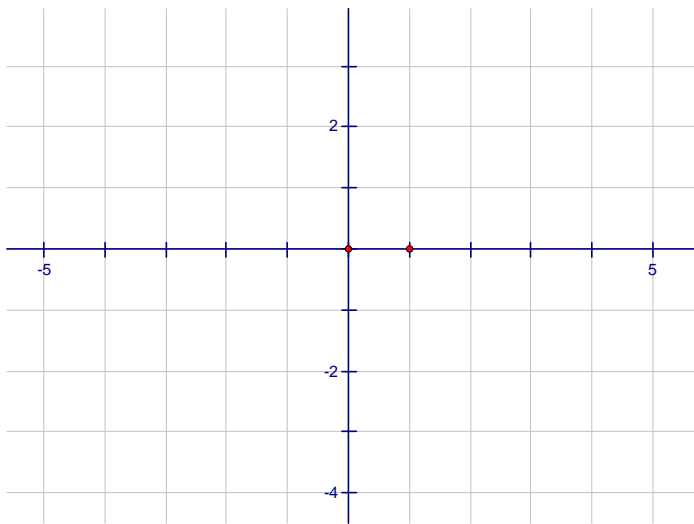
Name: \_\_\_\_\_

Using your handheld, find the numerical approximation of the derivative of each function at the indicated point. Then sketch a graph of the functions and an approximate tangent line at the indicated point. Determine whether or not you think that the numerical derivative is a reasonable approximation for the exact derivative and explain your reasoning.

1.  $f(x) = x^3 - 4x + 7$  at  $x = 2$

$f'(2) =$  \_\_\_\_\_

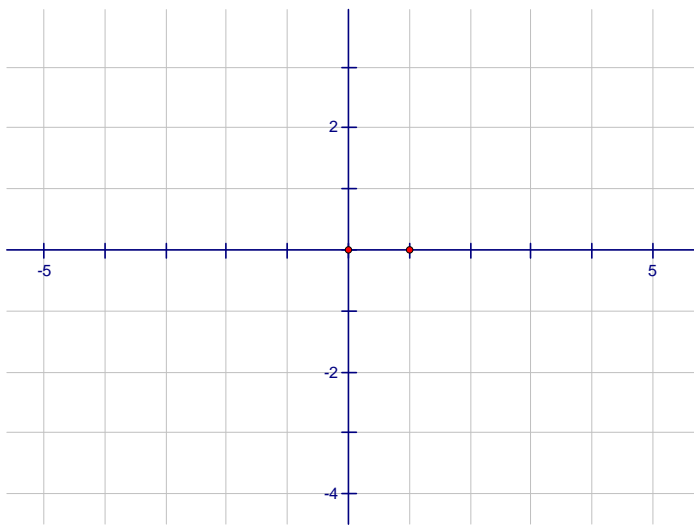
Is the approximation reasonable?  
Why or why not?



2.  $f(x) = 3\sqrt{x-4}$  at  $x = 5$

$f'(5) =$  \_\_\_\_\_

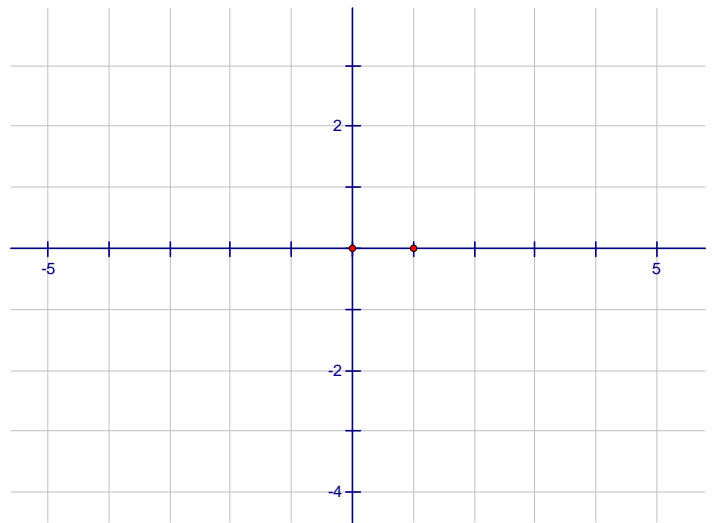
Is the approximation reasonable?  
Why or why not?



3.  $f(x) = \sqrt{x}$  at  $x = 0$

$f'(0) =$  \_\_\_\_\_

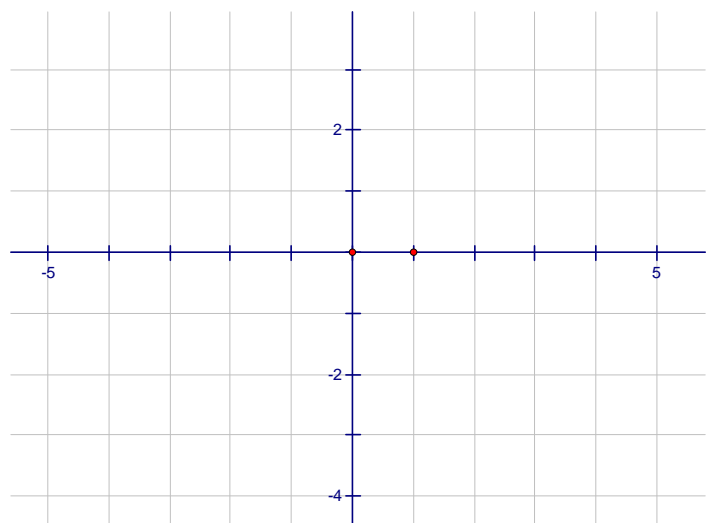
Is the approximation reasonable?  
Why or why not?



4.  $f(x) = |x-3|$  at  $x = 3$

$f'(3) =$  \_\_\_\_\_

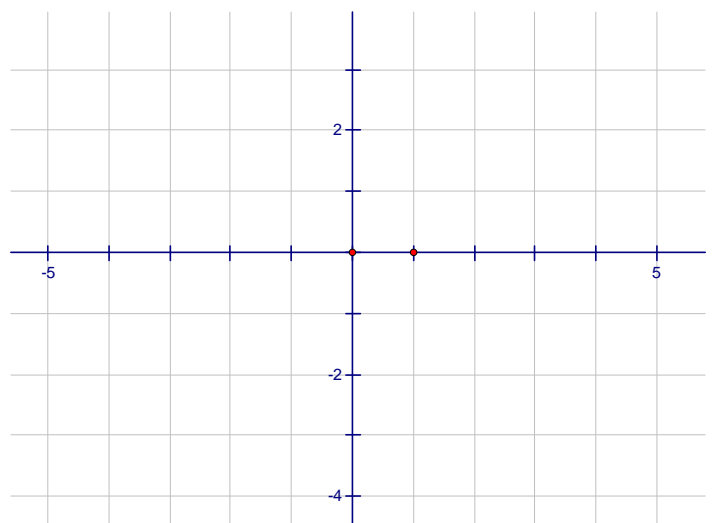
Is the approximation reasonable?  
Why or why not?



5.  $f(x) = \sqrt[3]{x-3}$  at  $x = 3$

$f'(3) =$  \_\_\_\_\_

Is the approximation reasonable?  
Why or why not?



6. For the problems in which the numerical derivative is not an accurate approximation of the exact value of the derivative, what characteristics does each function have at the indicated point that causes difficulty in calculating an accurate approximation of the derivative?

