

AB Calculus (Calculator OK)
Average vs. Instantaneous Rate of Change

name _____

<p>1. Suppose $g(t) = 1 - t^2$.</p> <p>a. Find the slope of the line secant to $g(t)$ from $t = -1$ to $t = 3$.</p>	<p>d. If $g(t)$ gives the temperature ($^{\circ}\text{C}$) of a liquid at time t (sec), find the average rate of change of the temperature between $t = 18$ seconds and $t = 21$ seconds. Include units with your answer.</p>
<p>b. Find the average rate of change of g on the interval $[-1, -5]$</p>	<p>f. Find the instantaneous rate of change of g at $t = -1$.</p>
<p>c. Suppose g represents the position (in cm) of an object at time t seconds. Find the average velocity of the object on the time interval starting at $t = -1$ and lasting .1 seconds. Include units with your answer.</p>	<p>g. Find the slope of the line tangent to $g(t)$ at $t = 0$. Then find the slope of the line normal(perpendicular) to the tangent line at $t = 0$.</p>

3. a) Use the limit definition to find the derivative of $f(x) = x^2 - 2x$

b) Use the alternate form of the definition to find $f'(2)$.

4. a) Use the limit definition to find the slope of the tangent line of $g(x) = \frac{1}{x+2}$.

b) Use the alternate form of the definition to find $g'(2)$.

5. The graph of the function $k(x)$ is drawn below. Use it to answer the following questions.

a. On what interval(s) is $k(x)$ positive?

b. On what interval(s) is $k(x) < 0$?

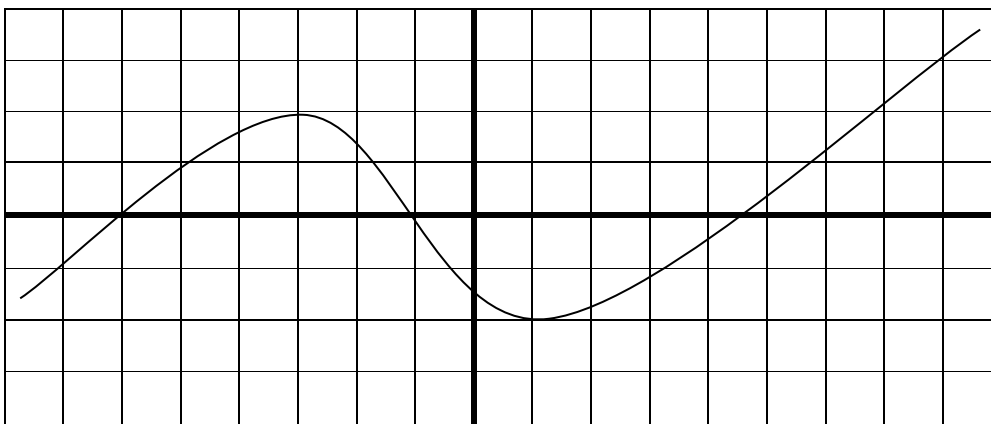
c. On what interval(s) is $k(x)$ increasing?

d. On what interval(s) is $k(x)$ decreasing?

e. On what interval(s) does the line tangent to $k(x)$ have a positive slope?

g. On what interval(s) does the line tangent to $k(x)$ have a negative slope?

h. For which value(s) of x does the line tangent to $k(x)$ have a slope of zero.



Each tick
mark is 2
units.