

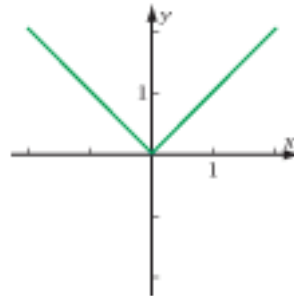
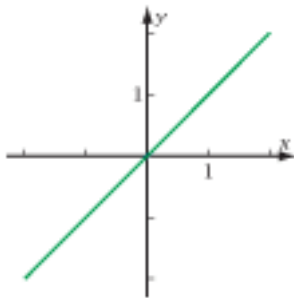
Calculus H
Ch. 2 #1

Name _____

Quick Review

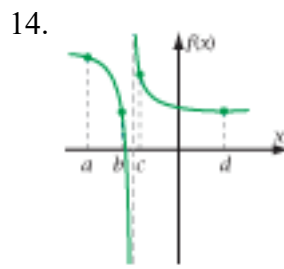
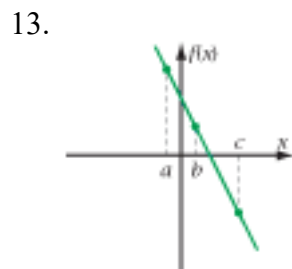
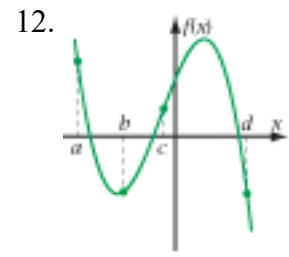
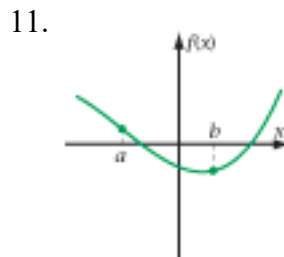
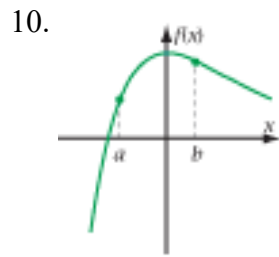
1. Name the type of function: $f(x) = x^3$. _____
2. Find $f(2)$ for the function in #1. _____
3. Name the type of function: $g(x) = 3^x$. _____
4. Find $g(2)$ for the function in #3. _____
5. Sketch the graph: $h(x) = x^2$.

6. Find $h(5)$ for the function in #5. _____
7. Write the general equation for a quadratic function. _____
8. Write the equation for the function shown below.
 - a. _____
 - b. _____



9. What name is given to the instantaneous rate of change of a function? _____

The following problems show graphs of functions with values of x marked a , b , and so on. At each marked value, state whether the function is increasing, decreasing, or neither as x increases from left to right, and also whether the rate of increase or decrease is fast or slow.



15. The population of foxes in a particular region varies periodically due to fluctuating food supplies. Assume that the number of foxes, $f(t)$, is given by $f(t) = 300 + 200 \sin(t)$, where t is time in years after a certain date.

a. Sketch the graph of $f(t)$ (use your graphing calculator) using a window of $[0, 10]$ for t . On the sketch, show a point where $f(t)$ is increasing, a point where it is decreasing and a point where it is not changing much.

b. The change in $f(t)$ from 1 year to t is $(f(t) - f(1))$. So for the time interval $[1, t]$, $f(t)$ changes at the average rate $r(t)$ given by $r(t) = \frac{f(t) - f(1)}{t - 1}$. Enter $r(t)$ into your graphing calculator. Make a table of values for $r(t)$ for each .01 year from 0.97 through 1.03.

c. The instantaneous rate of change of $f(t)$ at $t = 1$ is the limit $r(t)$ approaches as t approaches 1. Explain why your calculator gives an error message if you try to calculate $r(1)$. Find an estimate for the instantaneous rate by taking values of t closer and closer to 1. What special name is given to this instantaneous rate?

d. At approximately what instantaneous rate is the fox population changing at $t = 4$? Explain why the answer is negative.

For the following problems,

a. Give the type of function.

b. State whether $f(x)$ is increasing or decreasing at $x = c$, and how you know this.

16. $f(x) = x^2 + 5x + 6$, $c = 3$

17. $f(x) = 2^x$, $c = -3$

18. $f(x) = -\frac{1}{x}$, $c = -2$

19. $f(x) = \sin x$, $c = 2$ (radian mode)