

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

## Secant and Tangent Lines

### I. Find the equation of the secant line through the indicated points for each.

1).  $f(x) = x^2 - 3x + 5$  from  $x = 0$  to  $x = 3$

2).  $f(x) = x^3 + 10$  from  $x = -1$  to  $x = 1$

3).  $f(x) = x^4 + 10$  from  $x = -1$  to  $x = 1$

4).  $f(x) = \sqrt{x-3} + 2$  from  $x = 7$  to  $x = 12$

5).  $f(x) = \cos x$  from  $x = 0$  to  $x = \frac{3\pi}{2}$

6). Using the following table, find the equation of the secant line through  $x = 10, x = 17$

$x$	-4	0	3	10	13	15	17
$f(x)$	-17	-2	13	19	11	28	34

### II. Find the instantaneous rate of change (derivative) for each at the given $x$ value.

7).  $f(x) = 3x - 1$ ; at  $x = 0$

8).  $f(x) = x^2$ ; at  $x = 1$

9).  $f(x) = x^2 + x - 1$ ; at  $x = 2$

10).  $f(x) = \sqrt{x+8} + 3$ ; at  $x = 1$

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**III. Find the tangent line of each at the given  $x$  value.**

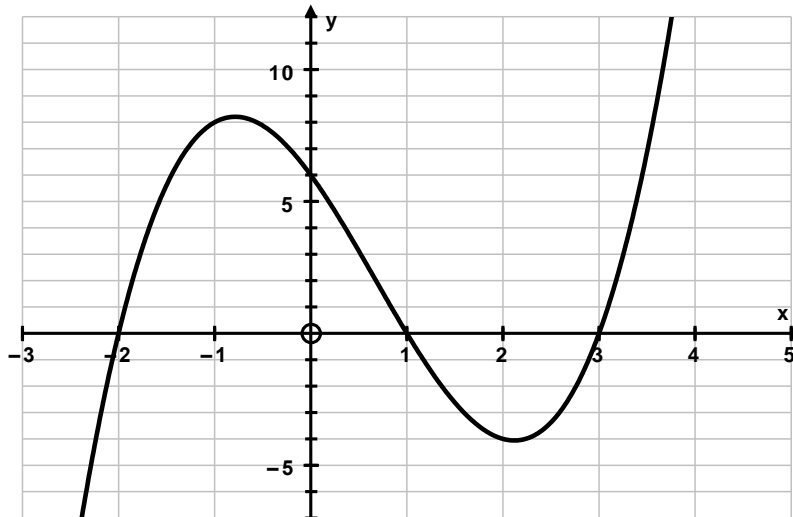
11).  $f(x) = 2x - 1$ ; at  $x = -35$

12).  $f(x) = x^3$ ; at  $x = -1$

13).  $f(x) = x^3 + x^2 - 2x - 3$ ; at  $x = -2$

14).  $f(x) = \sqrt{x-3} + 6$ ; at  $x = 12$

**IV. Use the graph below for the following problems.**



15). Use a ruler to draw the secant line from  $x = -1$  to  $x = 2$  on/for the above function.

16). Estimate at least one value of  $x$  in the interval  $[-1, 2]$  that would have a tangent line that is parallel to the secant line drawn in #15. Graph the tangent line.

17). Estimate what values of  $x$  (if any) would have tangent lines with slopes of zero.

18). Estimate what value of  $x$  would have the largest (positive or negative) slope in the interval  $[-1, 2]$ .