

6.3 Newton Quotient Worksheet

This document was composed and formatted by Annie Bernatchez.

The course material originated from www.jensenmath.ca

1) Find the equation of the derivative for each of the following functions. Also, find the instantaneous rate of change for the function when $x = 4$ and $x = -1$.

a) $f(x) = 3x - 8$	b) $y = 20x + x^2$
c) $y = 2x^3 + 4$	d) $f(x) = x^2 - 9x + 17$
e) $f(x) = \frac{x(x+1)}{2}$	f) $f(x) = \frac{1}{x}$

2) State whether the functions are increasing, decreasing, or neither when $x = 4$ for each function in #1. How do you know?

3)a) State the derivative of $f(x) = x^3$

b) Evaluate $f'(-6)$

c) Determine the equation of the tangent line at $x = 6$

Answer Key

1) a) $f'(x) = 3$, $f'(4) = 3$, $f'(-1) = 3$ b) $f'(x) = 20 + 2x$, $f'(4) = 28$, $f'(-1) = 18$

3. $f'(x) = 6x^2$, $f'(4) = 96$, $f'(-1) = 6$

4. $f'(x) = 2x - 9$, $f'(4) = -1$, $f'(-1) = -11$

e) $f'(x) = x + \frac{1}{2}$, $f'(4) = \frac{9}{2}$, $f'(-1) = -\frac{1}{2}$ f) $f'(x) = -\frac{1}{x^2}$, $f'(4) = -\frac{1}{16}$, $f'(-1) = -1$

2) a, b, c and e are increasing functions when $x = 4$ since the instantaneous rate of change is positive

d and f are decreasing when $x = 4$

3) a) $f'(x) = 3x^2$ b) 108 c) $y = 108x - 432$