

## Math 16, Homework 6

Textbook exercises: Section 2.1, Exercises 2, 3, 4, 7.

Additional exercises:

1. In this exercise, and in Exercises 2 -6, find the derivative of the function  $f$  at  $x = a$  by computing

$$\lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

numerically. Then find the equation of the tangent line to the graph of  $y = f(x)$  at the point  $(a, f(a))$ .

For this exercise,  $f(x) = x^2 + 2x - 3$ ,  $a = 1.5$

2.  $f(x) = \ln(x)$ ,  $a = 2.4$
3.  $f(x) = \sin(x^2)$ ,  $a = \pi/3$ .
4.  $f(x) = x^3$ ,  $a = 1$ .
5.  $f(x) = x^4$ ,  $a = 1$ .
6.  $f(x) = x^5$ ,  $a = 1$ .
7. What is the pattern in exercises 4-6?
8. Find the derivative of the function  $f(x) = 1/x$  directly from the definition of derivative.
9. Find the derivative of the function  $f(x) = 1/x^2$  directly from the definition of derivative.