

Math 61 Learning Unit 3 Hand-In Assignment for Section 3.6

*In all of the problems in this set (except the last two), every derivative must be calculated algebraically by showing every step. **You are not permitted to use shortcuts like the power rule. If you use shortcuts, you get zero credit.***

1. $f(x) = -2x^2 + 3x - 4$. Calculate $f'(x)$

Hint: Similar to Section 3.6 Exercise 21 in the book.

2. $f(x) = -x^3 + 3x - 1$. Calculate $f'(x)$

Hint: Similar to Section 3.6 Exercise 23 in the book.

3. $f(x) = \frac{1}{2x}$. Calculate $f'(x)$

Hint: Similar to Section 3.6 Exercise 25 in the book.

4. $f(x) = \frac{2x}{a} + b$; a and b constants. Calculate $f'(x)$

Hint: Similar to Section 3.6 Exercise 27 in the book.

5. Find the equation of the tangent line to $f(x) = 3x^2 + 1$ at the point where $x = -2$.

Hint: Similar to Section 3.6 Exercises 39–43 in the book.

6. The height of a soccer ball kicked by Javier “Chicharito” Hernández on Mars is given by $h(t) = 76t - 1.9t^2$ meters, where t is time in seconds after he kicks it.*

a. Calculate the derivative function $h'(t)$.

b. According to your calculation in part (a), how fast is the ball moving 10 seconds after he kicks it, and in what direction?

Hint: Similar to Section 3.6 Exercise 45 in the book.

7. Textbook Section 3.6 Exercise 58.

8. Textbook Section 3.6 Exercise 60.

Hint: Similar to 4.1 Exercise 95 in the book.

* The equation is quite accurate in the thin atmosphere of Mars, assuming that Chicharito were to venture there and kick the ball hard enough