Classwork 38

1. Given $f(x) = 2x^3 - 18x + 5$

a) Write a limit that would give the derivative at a point **x.** You do not have to simplify.

b) Write a limit that would give the derivative when x = 4. You do not have to simplify.

c) Plug in a very small number for **h** in order to predict the answer for your limit in (b).

d) Find the slope at x = 4 using the rule.

e) When does the curve have a slope of 6?

2. Find the derivative of each function.

a) $y = \dfrac{1}{x^7}$

b) $y = \dfrac{6}{x^4}$

c) $y = 3\sqrt[3]{x}$

d) $y = 10\sqrt[5]{x^8}$

e) $y = 2x^{-1/4}$

f) $y = 20x^{1/5}$

g) $y = 9x^{-3/2}$

h) $y = 9\sqrt[3]{x} + \dfrac{4}{x^4} + 7x - x^2$

3. Find the tangent line to the curve $y = x^{2/3}$ at $x = 8$.

4. A line goes through the point $(0, -9)$. It is tangent to the curve $y = x^2$. Where does it hit the curve?

Practice Problems

1. Find the derivative of each function.

a) $y = 3/2x + 5$

b) $y = 5x^6 + 4x^4 - 5x^2 + 1$

c) $y = 2\sqrt[4]{x^5}$

d) $y = \dfrac{2}{x^5}$

2. Find the slope of each function at $x = 3$

3. Find the points when functions (c) and (d) have a slope of 64.