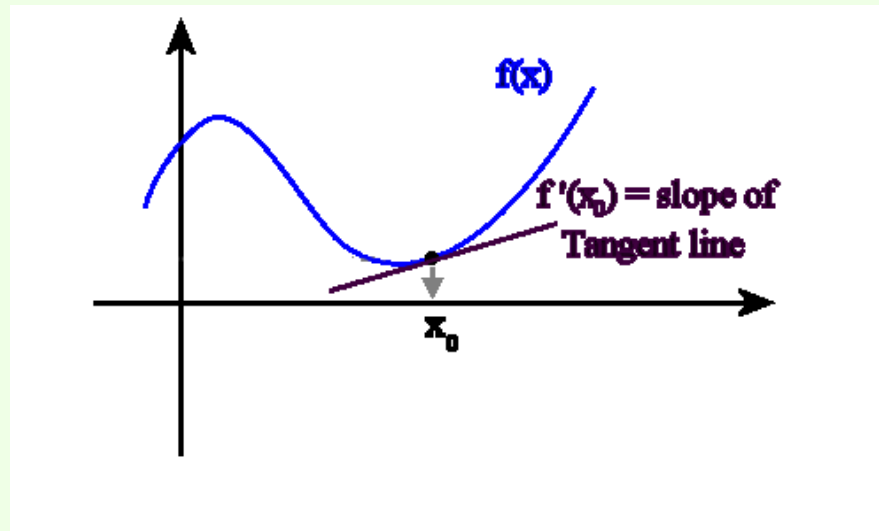


Unit 5 Day 4

Derivatives Practice and Review



Warm Up: (Practice Day)



1. Using the **limit definition of derivatives**, find the derivative of $f(x) = \sqrt{x + 11}$.

2. Find the derivative of $g(x)$ using the Power Rule. Express your answer with positive whole exponents and radicals.

$$g(x) = \frac{2}{x^4} + 6\sqrt{x} - x$$

3. Find the equation of the tangent line to $y = -x^3 + 13x^2 - 56x + 83$ at $x = 3$.

Write the line in slope intercept form.

Phones in pockets! We're looking at midterms today. 😊

Warm Up: (Review Day)



1. Using the **limits definition of derivatives**, find the derivative of $f(x)$ given below:
Simplify your answer. $f(x) = \sqrt{x + 11}$

Warm Up: (Review Day)



2. Find the derivative of $g(x)$ using the Power Rule. Express your answer with positive whole exponents and radicals.

$$g(x) = \frac{2}{x^4} + 6\sqrt{x} - x$$

3. Find the equation of the tangent line to $y = -x^3 + 13x^2 - 56x + 83$ at $x = 3$. Write the line in slope intercept form.

Warm Up: ANSWERS



1. Using the **limits definition of derivatives**,
find the derivative of: $f(x) = \sqrt{x+11}$
Simplify your answer.

$$f'(x) = \frac{1}{2\sqrt{x+11}}$$

Warm Up: ANSWERS



2. Find the derivative of $g(x)$ using the Power Rule. Express your answer with positive whole exponents and radicals.

$$g(x) = \frac{2}{x^4} + 6\sqrt{x} - x \quad g'(x) = -\frac{8}{x^5} + \frac{3}{\sqrt{x}} - 1$$

3. Find the equation of the tangent line to $y = -x^3 + 13x^2 - 56x + 83$ at $x = 3$. Write the line in slope intercept form.

$$y - 5 = -5(x - 3)$$

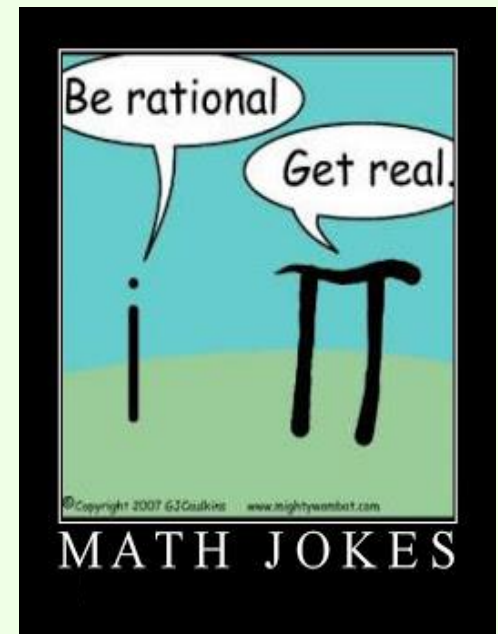
$$y = -5x + 20$$

Homework Questions?!



Tonight's Homework

- Quiz Review sheet
 - > Complete on Separate Paper
- Finish MATHO
(Packet p. 6)
- Study for Quiz!



MATHO



Practice: (Review Day)



1. Using the **limits definition of derivatives**, find the derivative of $f(x)$ given below:

Simplify your answer. $f(x) = \frac{2}{x - 4}$

Practice:

(Review Day) ANSWERS



1. Using the **limits definition of derivatives**, find the derivative of $f(x)$ given below.

Simplify your answer.

$$f(x) = \frac{2}{x - 4}$$

$$f'(x) = \frac{-2}{x^2 - 8x + 16}$$

Warm-Up (Quiz Day)

a) Find the equation of the line tangent to

$$y = 2x^3 + 4x^2 + x \text{ at } x = 2$$

b) Find the equation of the line tangent to

$$y = -4x^2 - 6x + 2 \text{ at } x = 3$$

c) Use the limit definition to find the

derivative of $f(x) = \frac{2}{x-3}$ and $g(x) = \sqrt{x-3}$

Warm Up (Quiz Day) ANSWERS

a) Find the equation of the line tangent to

$$y = 2x^3 + 4x^2 + x \text{ at } x = 2 \quad y - 34 = 41(x - 2)$$

$$y = 41x - 48$$

b) Find the equation of the line tangent to

$$y = -4x^2 - 6x + 2 \text{ at } x = 3 \quad y + 52 = -30(x - 3)$$

$$y = -30x + 38$$

c) Use the limit definition to find the

derivative of $f(x) = \frac{2}{x-3}$ and $g(x) = \sqrt{x-3}$

$$f'(x) = \frac{-2}{x^2 - 6x + 9}$$

$$g'(x) = \frac{1}{2\sqrt{x-3}}$$

Unit 5

Whiteboard Quiz Review

Derivatives

What is the limit definition of a derivative?

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

Find the derivative using the **limit definition** of derivatives.

$$f(x) = 2x - 4$$

$$f'(x) = 2$$

Find the derivative using the **power rule**.

Write your answer with positive, whole exponents or radicals.

$$f(x) = 4x^4 - 5x + 2\sqrt{x} - 3$$

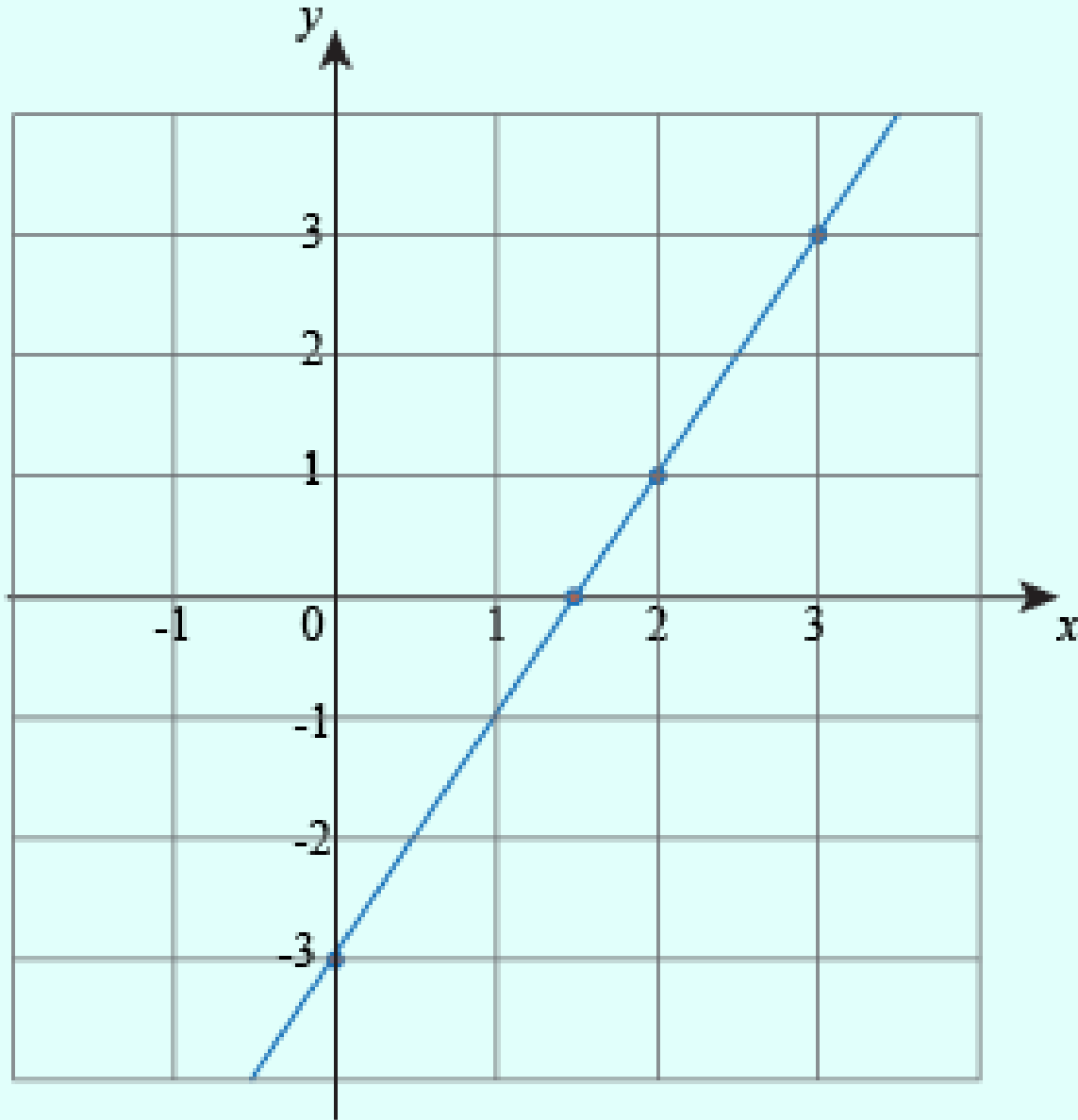
$$f'(x) = 16x^3 - 5 + \frac{1}{\sqrt{x}}$$

Find the slope of the function

$$y = -x^2 - 12\sqrt{x} - 5 \quad \text{at } x = 9.$$

$$m = -20$$

Find the derivative of the function.



$$y' = 2$$

Find the derivative using the **limit definition** of derivatives.

$$g(x) = x^2 - 5x + 6$$

$$g'(x) = 2x - 5$$

Find the derivative using the **power rule**.

Write answers with positive, whole exponents or radicals.

$$f(x) = -\frac{4}{x^5} + \frac{2}{x^3} + \sqrt[3]{x^5}$$

$$f'(x) = \frac{20}{x^6} - \frac{6}{x^4} + \frac{5\sqrt[3]{x^2}}{3}$$

Find the equation of the line tangent to

$$y = x^3 - 3x^2 + 2 \quad \text{point at } (3, 2).$$

$$y - 2 = 9(x - 3)$$

$$\text{or } y = 9x - 25$$

Find the slope intercept equation of the tangent line of when $x = 2$

$$g(x) = 5x^2 - 3x + 7$$



$$y = 17x - 13$$

Find the derivative using the **limit definition** of derivatives.

$$h(x) = \sqrt{2 + x}$$

$$h'(x) = \frac{1}{2\sqrt{x + 2}}$$

Find the equation of the line tangent to

$$y = x^3 - 2x^2 + 2 \quad \text{point at } (2, 2).$$

$$y - 2 = 4(x - 2)$$

$$\text{or } y = 4x - 6$$

Find the derivative using the **limit definition** of derivatives.

$$h(x) = \frac{2}{x+3}$$

$$h'(x) = \frac{-2}{x^2 + 6x + 9} = \frac{-2}{(x+3)^2}$$

Find the derivative using the **power rule**.

$$f(x) = x^{\frac{2}{3}}$$

$$f'(x) = \frac{2}{3\sqrt[3]{x}}$$

Find the derivative of the function

$$y = -x^3 + 3x^2 + 3 \text{ at } x = -1.$$

$$f'(x) = -9$$

Find the derivative using the **power rule**.

Express your solution with positive whole exponents and radicals.

$$g(x) = -\frac{1}{2}x^4 + 3x^{\frac{5}{3}} + 2x$$

$$g'(x) = -2x^3 + 5\sqrt[3]{x^2} + 2$$

MATHO

Questions on Packet p. 6

Homework

- Finish MATHO Packet p. 6
- Quiz Review sheet
- Study for Quiz!

