# Office Hours!

## Instructor:

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## Office Hours:

Mondays 2–3PM
Tuesdays 10:30–11:30AM
Thursdays 1–2PM
or by appointment

## Office:

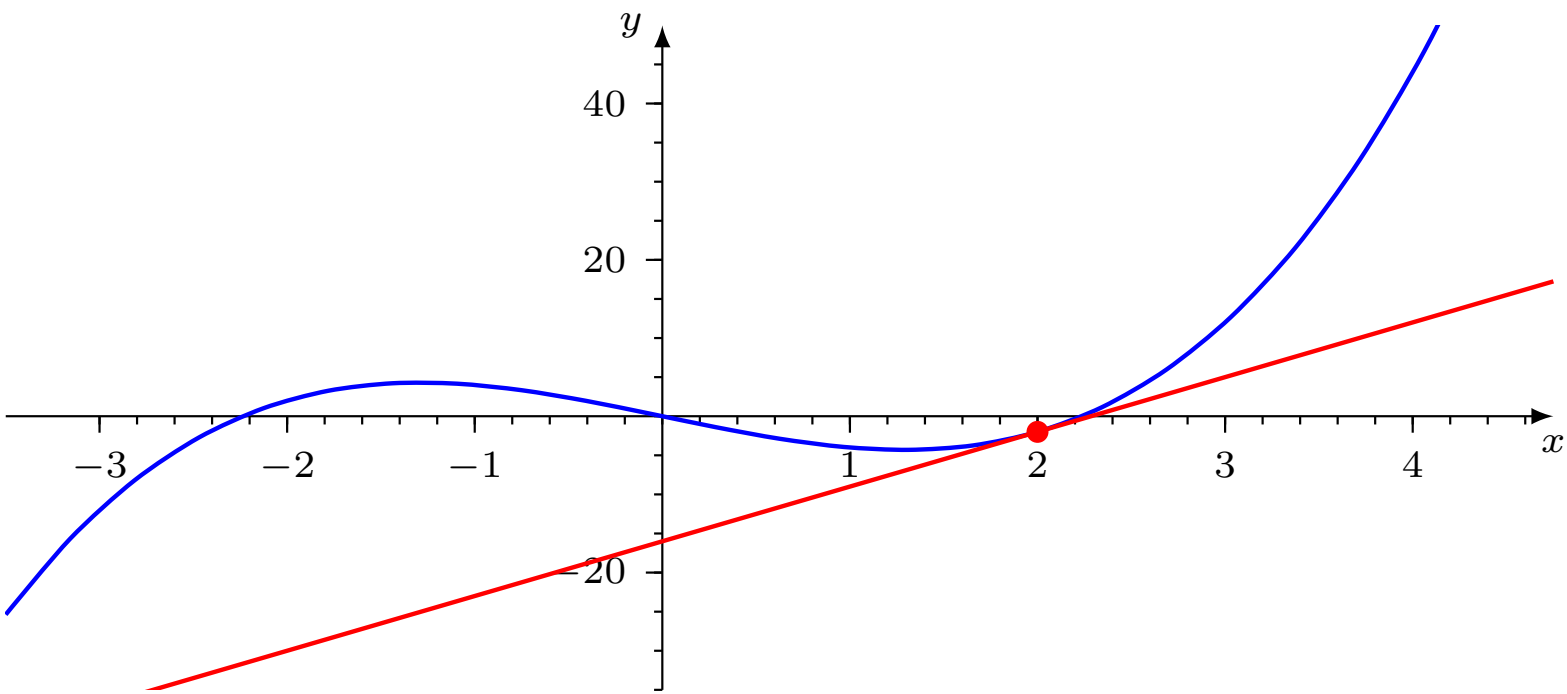
South Hall 6431X (Grad Tower, 6th floor, blue side, first door on the right)

# Review: Meaning of Derivatives

**1.** Find the equation of the tangent line to $y = x^3 - 5x$ at $x = 2$.

A $y = 2x - 6$ B $y = 16x - 7$ C $y = 7x + 16$ D $y = 7x - 16$

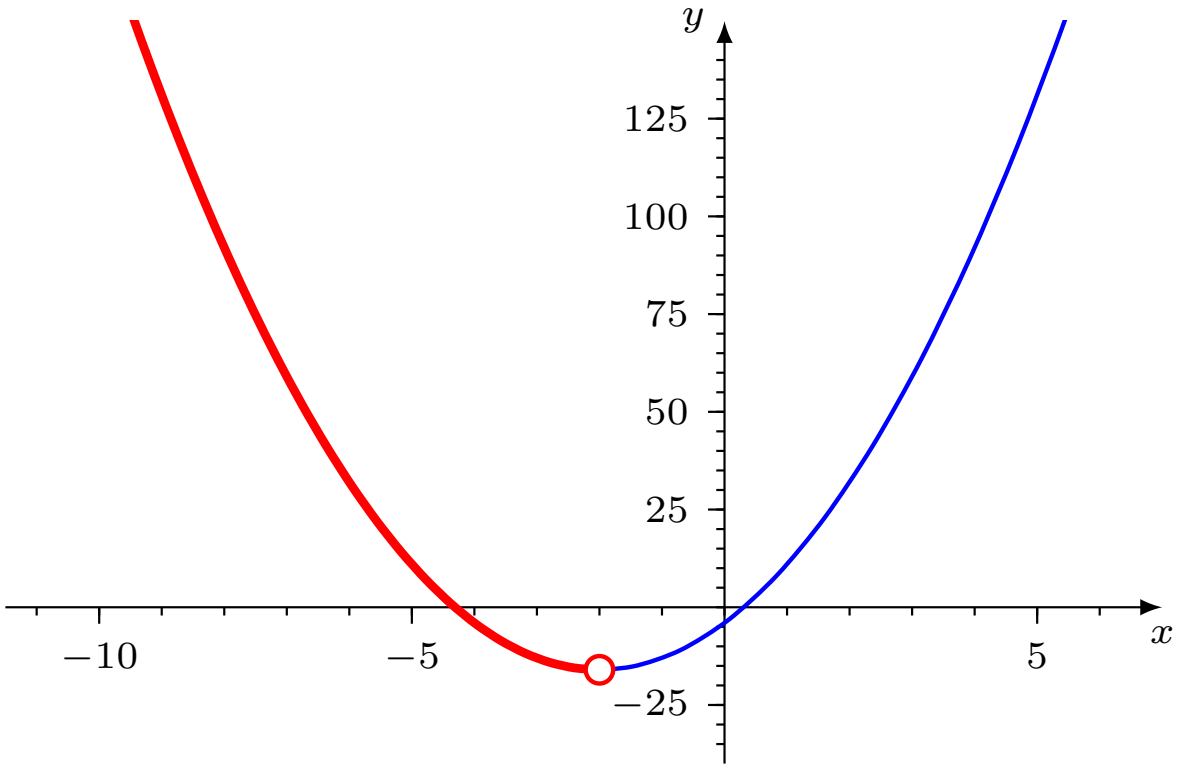
D



# Review: Meaning of Derivatives 2

**2.** Where is $f(x) = 3x^2 + 12x - 4$ decreasing?

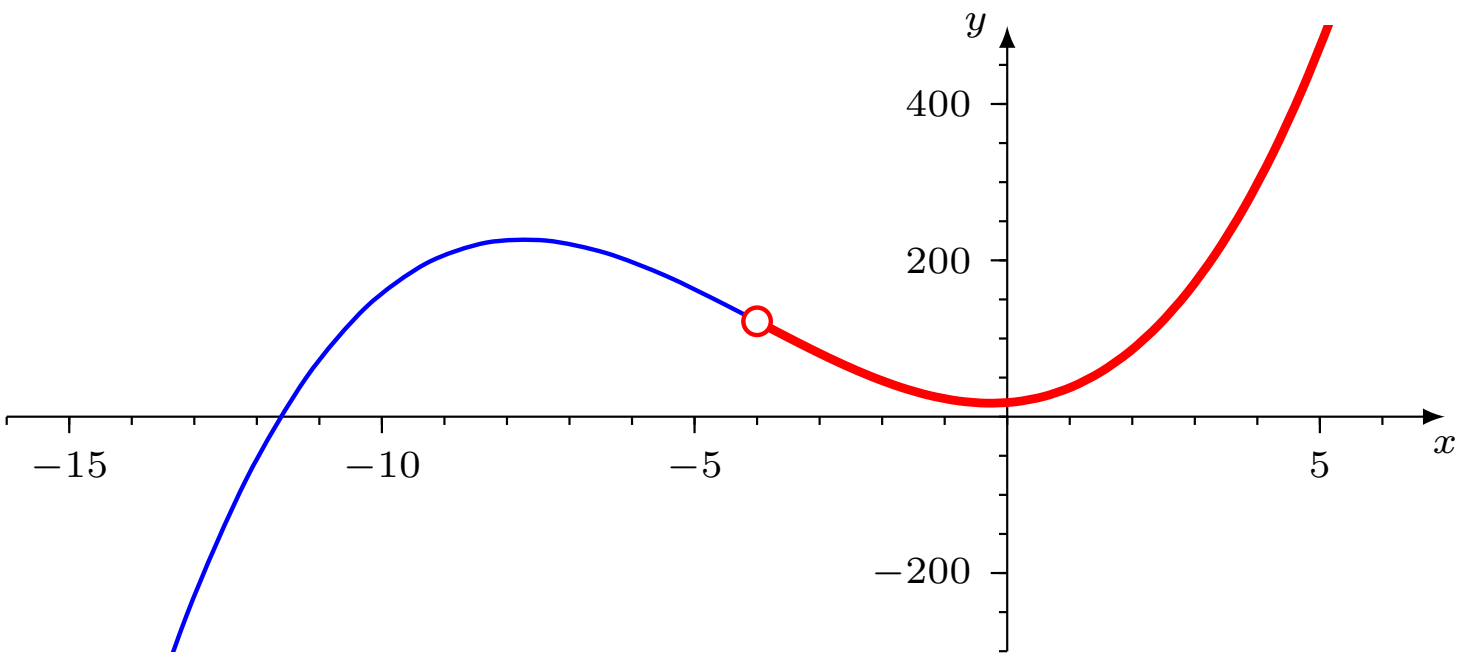
A $x < -2$ B $x > -2$ C $x < 2$ D $x > 2$ E $x = 2$ A



# Review: Meaning of Derivatives 3

**3.** Where is $f(x) = x^3 + 12x^2 + 6x + 18$ concave up?

A $x < -4$ B $x > -4$ C $x > -2$ D $x < -2$ B



# Review: Derivatives

**4.** Suppose

$$f(x) = 2x^4 - 3x^2 + 5x + 3$$

Click as you compute the following:

(A) $f'(x) = 8x^3 - 6x + 5$

(B) $f''(x) = 24x^2 - 6$

(C) $f'''(x) = 48x$

(D) $\dfrac{d^4 f}{dx^4} = 48$

**5.** Find the minimum of $f(x) = 2x^2 + 8x + 3$

A $= -5$ B $= -2$ C $= 0$ D $= 2$ E $= 5$ A

# Derivatives (cont'd)

**6.** Suppose $f(x) = x^2 - 4x + 5$. Click as you do the following:

(A) What is the slope of the graph when $x = 3$? $f'(3) = 2$

(B) What is the equation of the tangent line to the graph $y = f(x)$ at $x = 3$? $y = 2x - 4$

(C) Is the graph concave up or concave down? $f''(x) = 2 > 0$; concave up

**Hint:** Draw a picture!

How many did you get?

A = 3 B = 2 C = 1 D = 0 E = Don't press this button!

# Objects in Motion

**7.** A gorilla standing on top of Campbell Hall and throws a banana at a monkey on top of Cheadle Hall 100 meters away.

- $h(t) = 35 + 50t - 5t^2$ meters is the height of the banana $t$ seconds after it is thrown
- Banana lands at the monkey's feet 6 seconds after it is thrown

Click as you do the following:

(A) Draw a diagram showing Campbell Hall, Cheadle Hall, and the flight path of the banana.

(B) How high is Cheadle Hall? $h(6) = 155$ m

(C) How high above ground did the banana fly? $h(5) = 160$ m

(D) How high above Cheadle Hall did the banana fly? 5 m

(E) For how many seconds of the flight was the banana gaining height? until $h'(t) = 0$; until $t = 5$ seconds

(A) How fast was the banana going when it landed? $|h'(6)| = 10$ m/s