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To Be Announced
For Exam Week

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Review: Rates of Change

1. Suppose $f(x) = x^2 - x$.

(a) What is the average rate of change of $f(x)$ between $x = 1$ and $x = 3$?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

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Answer: C

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Review: Rates of Change (cont'd)

2. The table below shows the number total number of people treated in a hospital up to and including the day shown during a flu outbreak.

days	0	3	7	9
cases	0	18	56	81

(a) On average, how many people were treated per day during the first week?

(A) 56 (B) 38 (C) 81 (D) 8

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Jason & Marie

- Jason Bourne and Marie Kreutz are 270 miles apart at noon.
- Marie drives towards Jason at constant speed M starting at noon.
- Jason sets out at 2pm driving towards Marie at constant speed J.
- They meet at 4pm.

3. Which of the following equations is true?

(A) $J + M = 270$ (B) $2J = 4M$ (C) $J - M = 270$

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4. Which of the following equations is true?

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5. What was Jason's speed?

(A) 35 (B) 45 (C) 55 (D) 65 (E) 75

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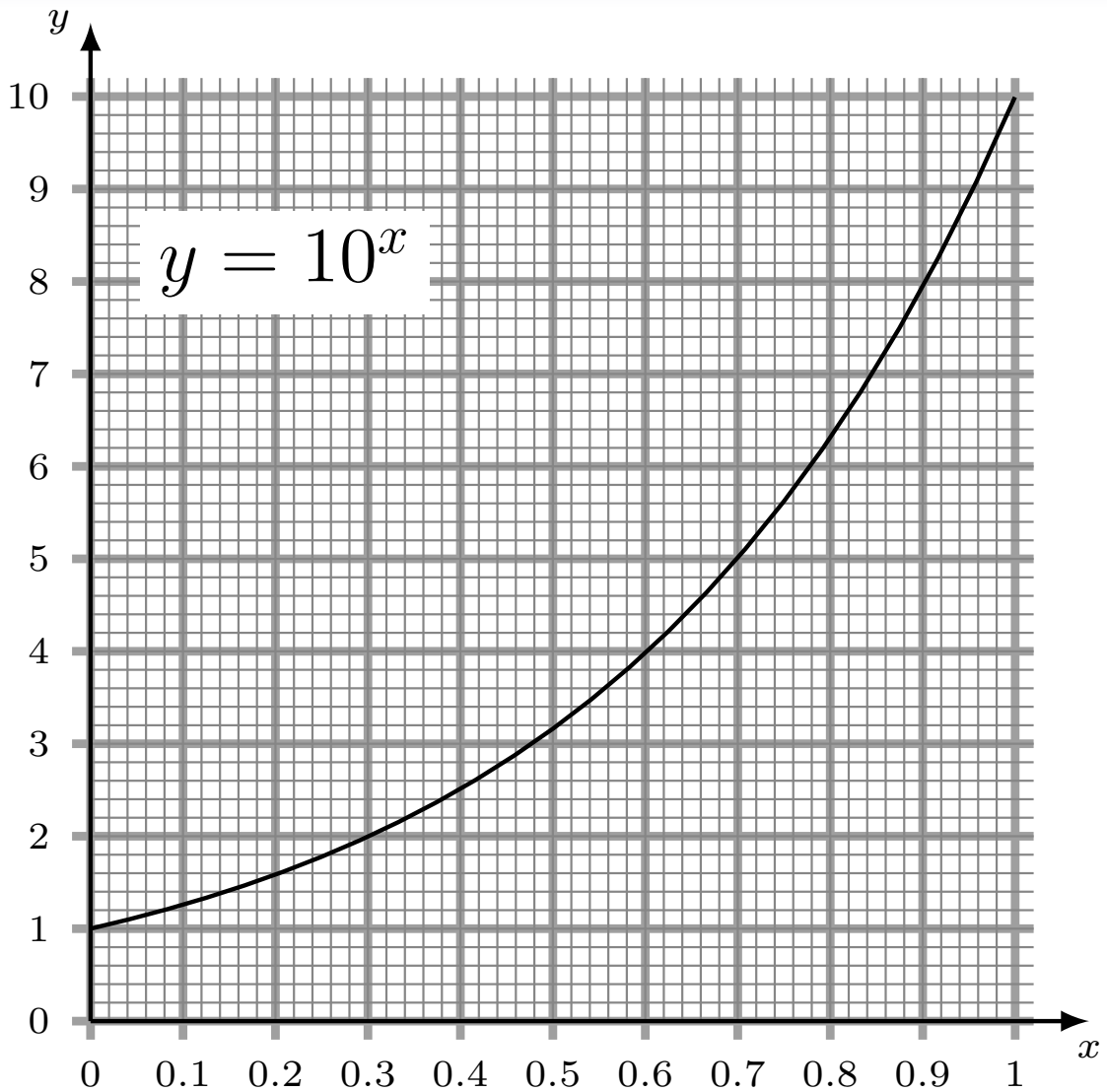


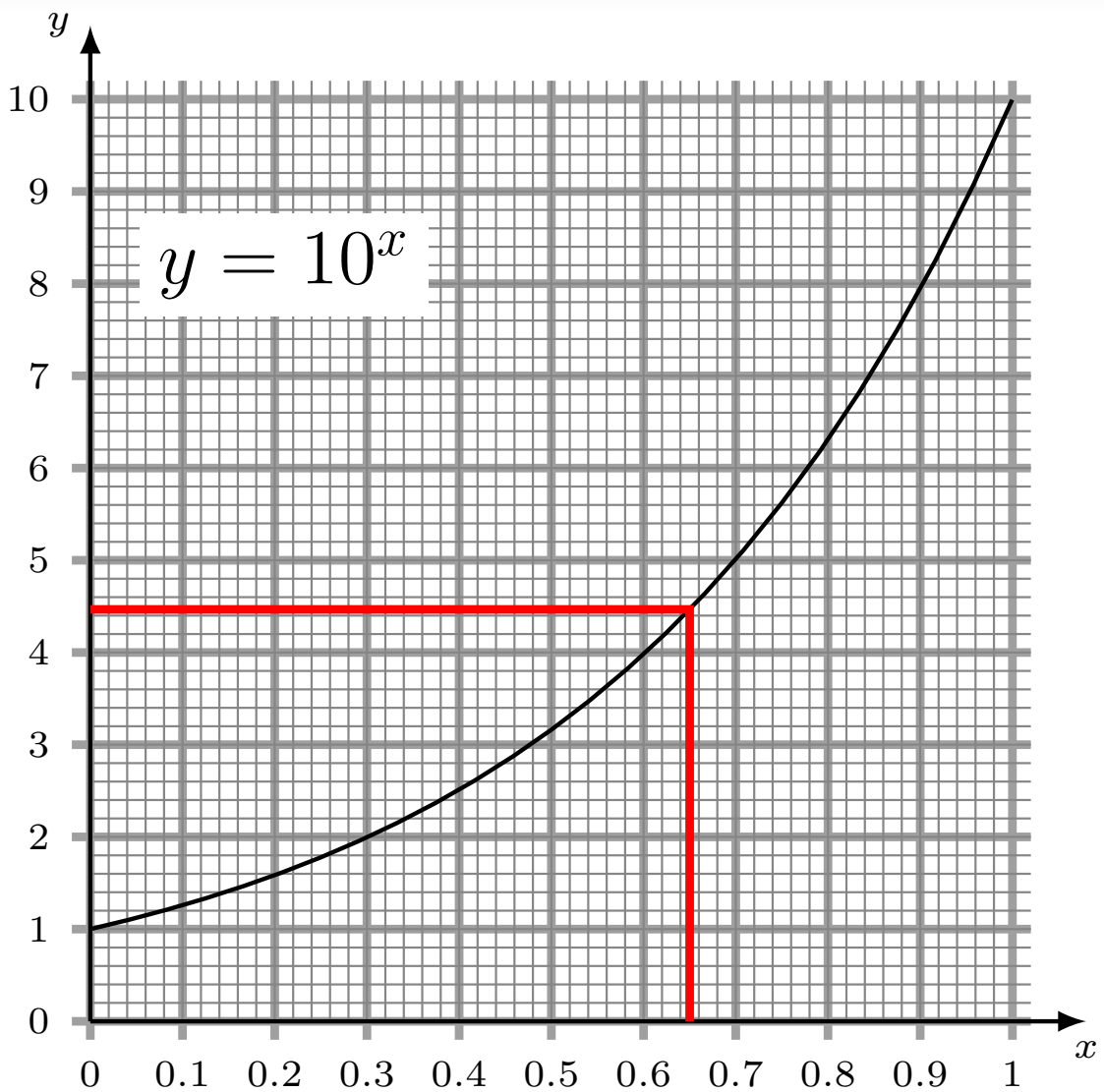
6. Use the graph of $y = 10^x$ to find:

(A) $10^{3.65}$

(B) Solve $10^x = 73$

(C) The slope of the graph at $x = 0.65$

(D) The average rate of change of 10^x between $x = 0.1$ and $x = 0.6$



6. Use the graph of $y = 10^x$ to find:

(A) $10^{3.65}$

Answer: 4500

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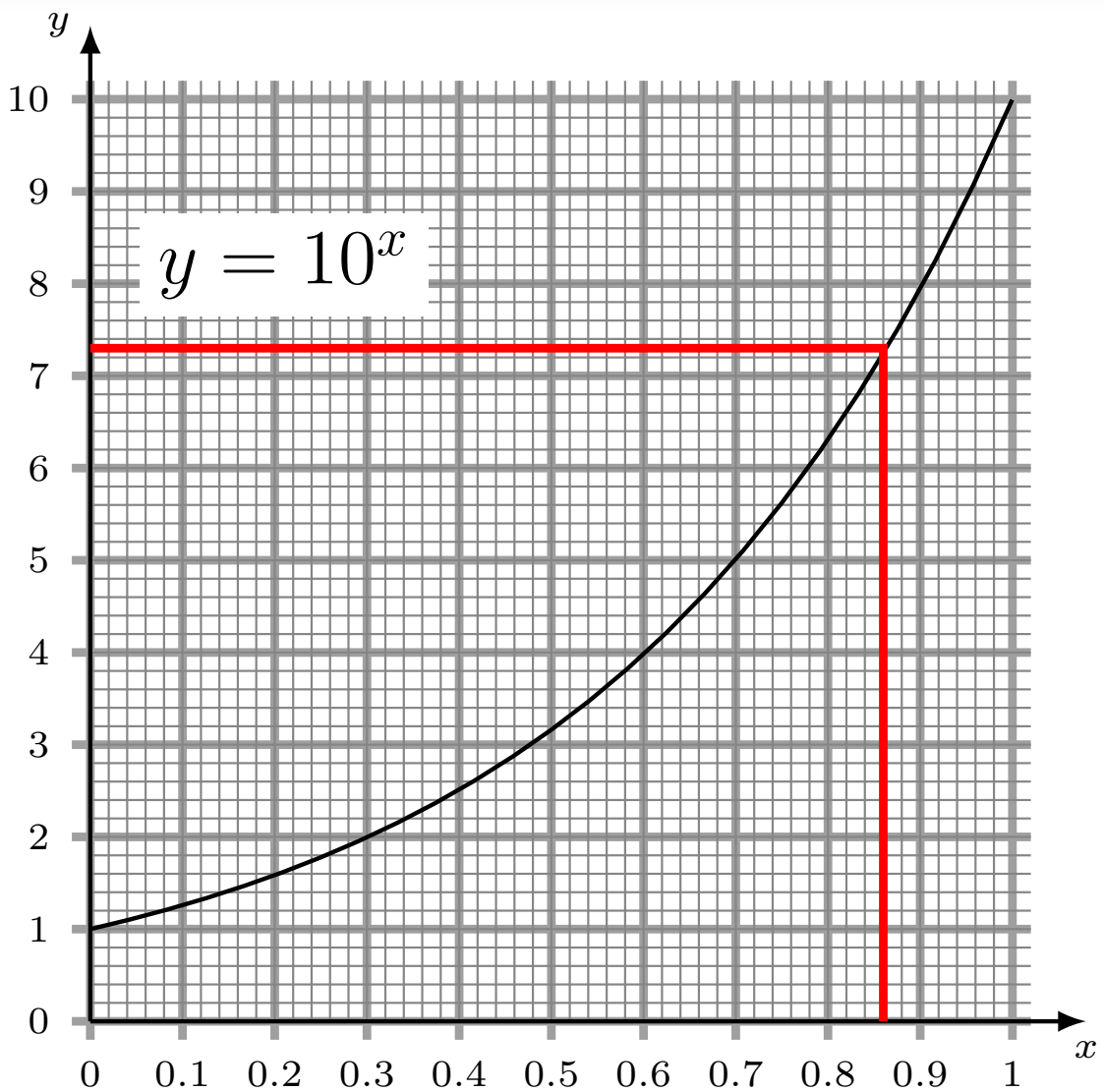

6. Use the graph of $y = 10^x$ to find:

(A) $10^{3.65}$

Answer: 4500

(B) Solve $10^x = 73$

Answer: 1.86

(C) The slope of the graph at $x = 0.65$

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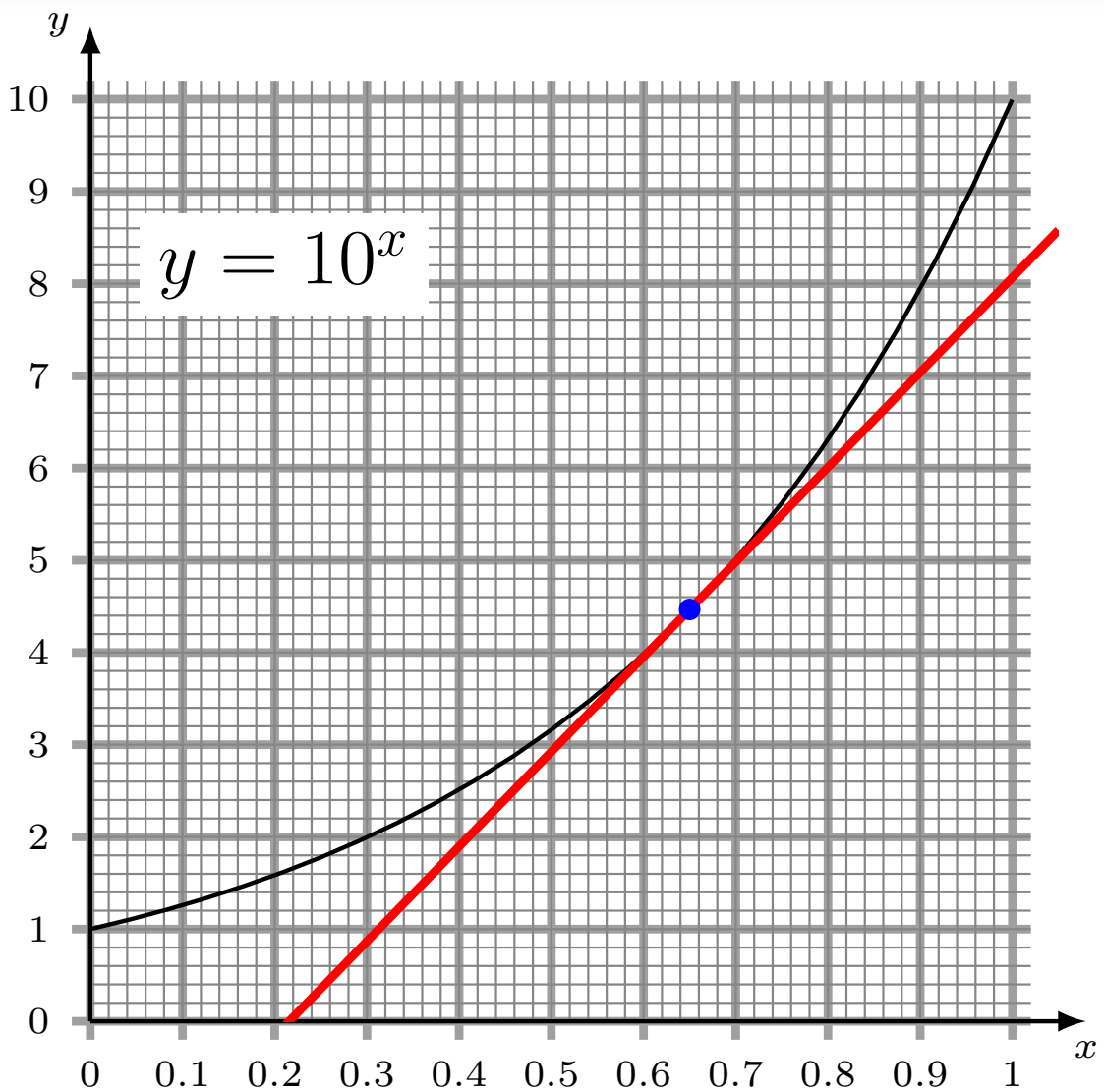

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Answer: 10 (10.285)

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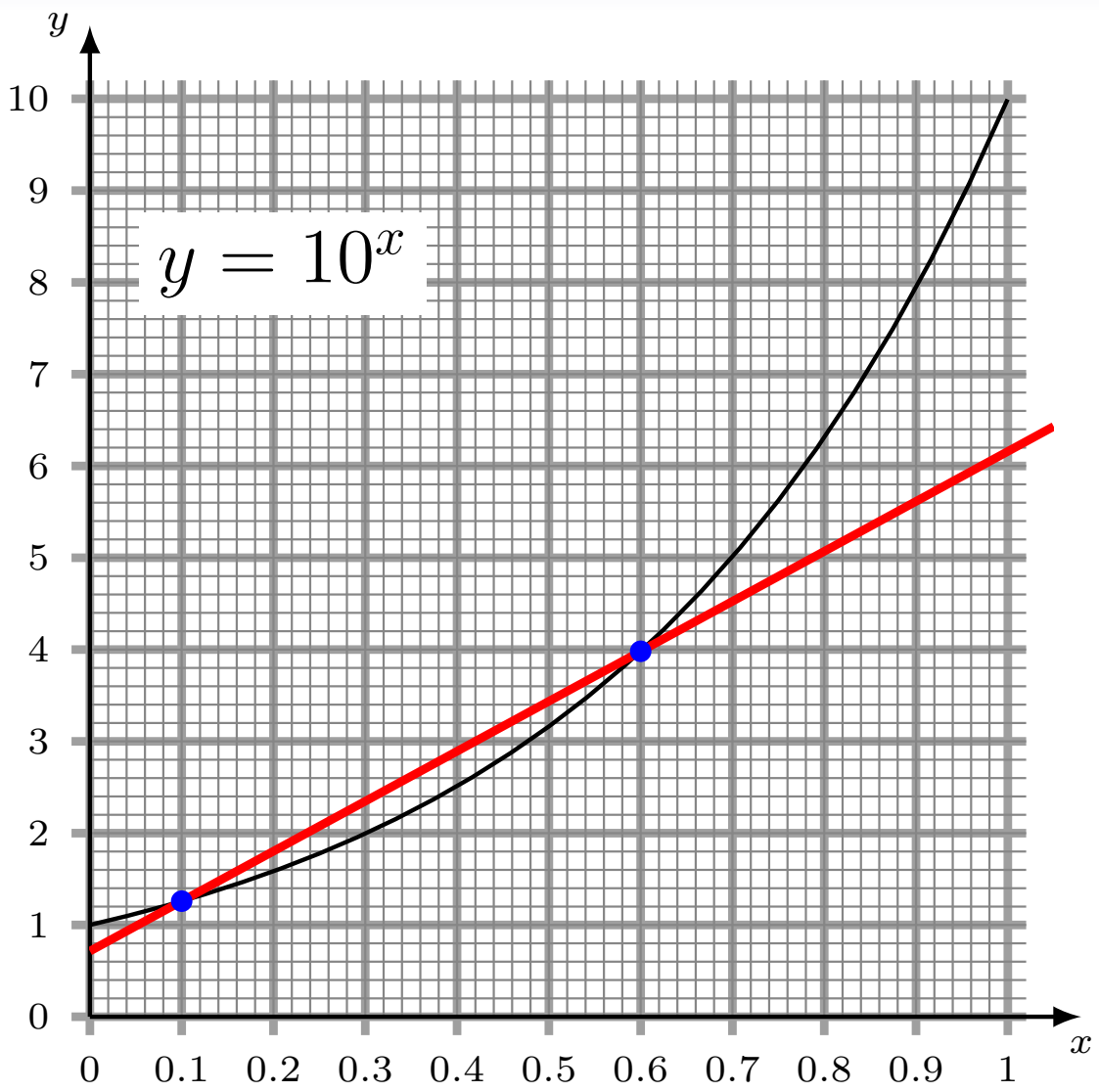

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Answer: 10 (10.285)

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Answer: 5 (5.444)

HW 23 Problem #4

A commuter railway has 800 passengers per day and charges each one two dollars per day. For each 4 cents that the fare is increased, 5 fewer people will go by train. What is the greatest profit that can be earned?

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"Profit" in this case must mean "Revenue"

Old Final #4 Problem #10

Bob's House of Index Cards sells note cards for exams. If the price is 5 cents, he sells 350 cards. For each cent he increases the price, he sells 10 fewer cards.

(a) If he sells each card for $(5 + x)$ cents, how many are sold?

(b) What is the total amount of money Bob gets by selling cards for $5 + x$ cents each. ***Simplify your answer.***

(c) What price for the card gives Bob the most money?

(d) How many cards does he sell to make the most money?

Old Final #4 Problem #8

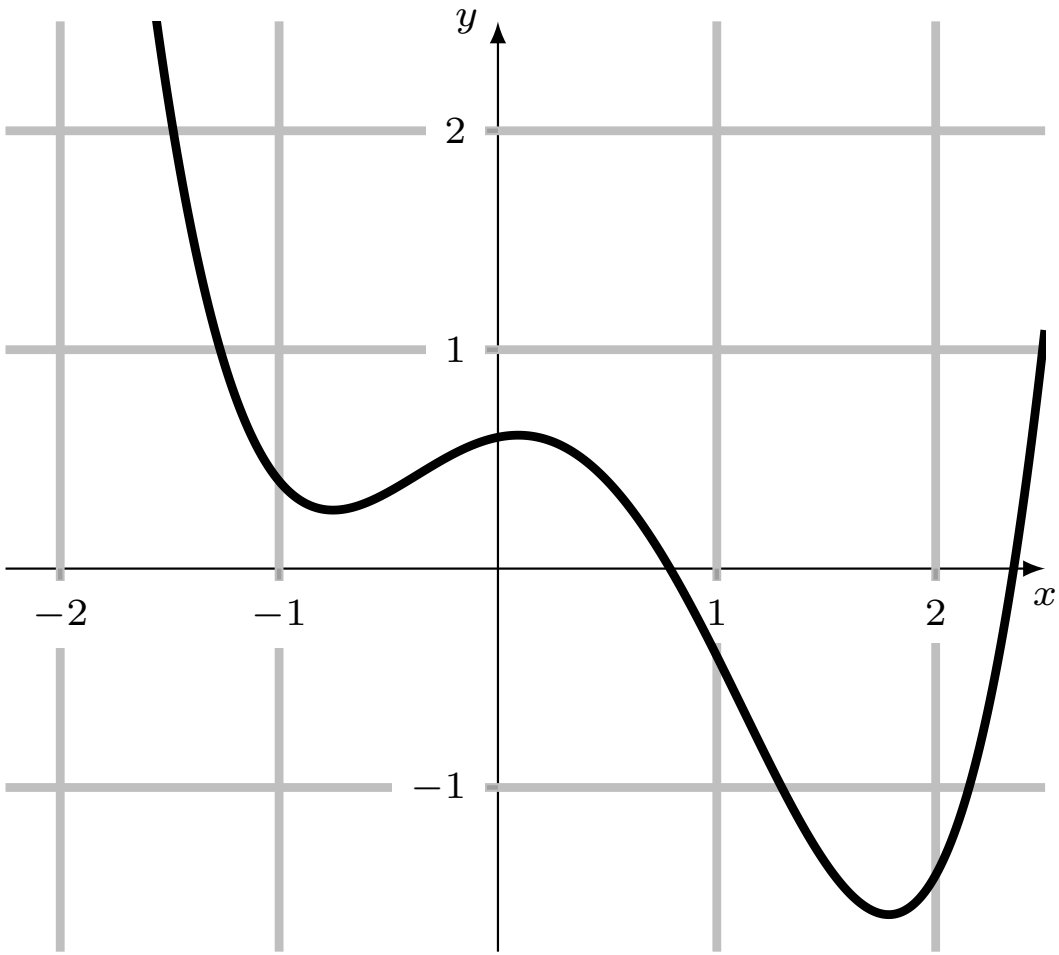
Let $f(x) = 2e^{3x} - 5x$.

(a) Find $f'(0)$.

(b) Find the tangent line approximation to $y = f(x)$ at $x = 0$.

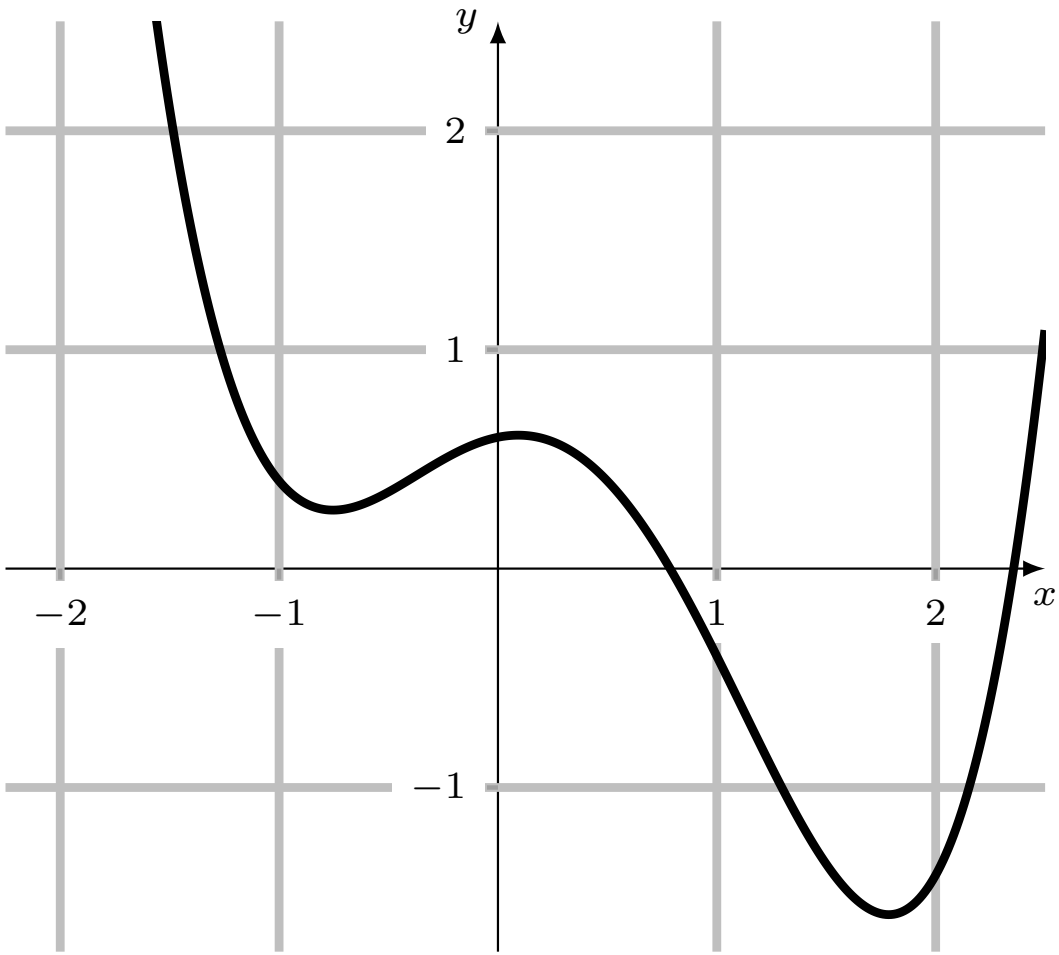
(c) Use this to approximate the value of $f(-0.1)$.

Old Final #4 Problem #7



(a) For which value(s) of x is $f'(x) = 0$?

Old Final #4 Problem #7



(b) For which values of x is $f''(x) < 0$?

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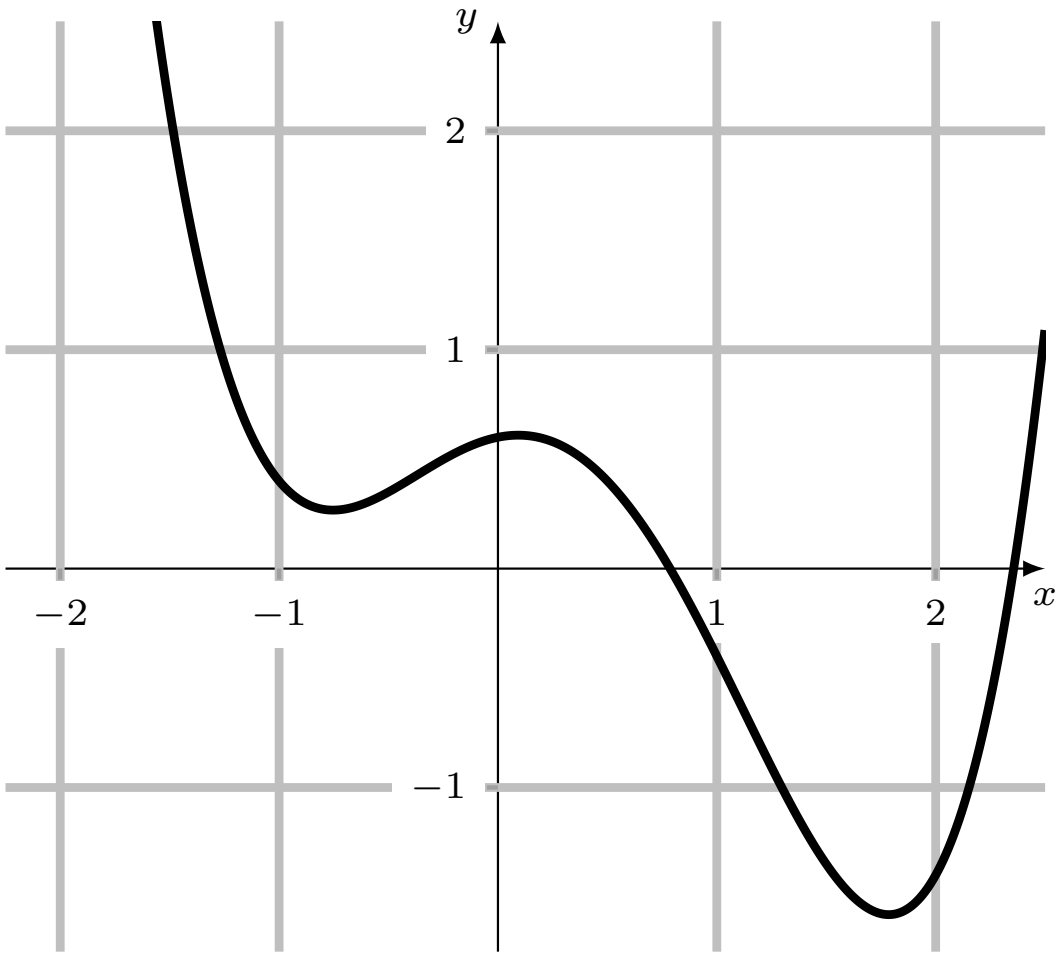

(c) Find a single value of x with $f'(x) = -2$.

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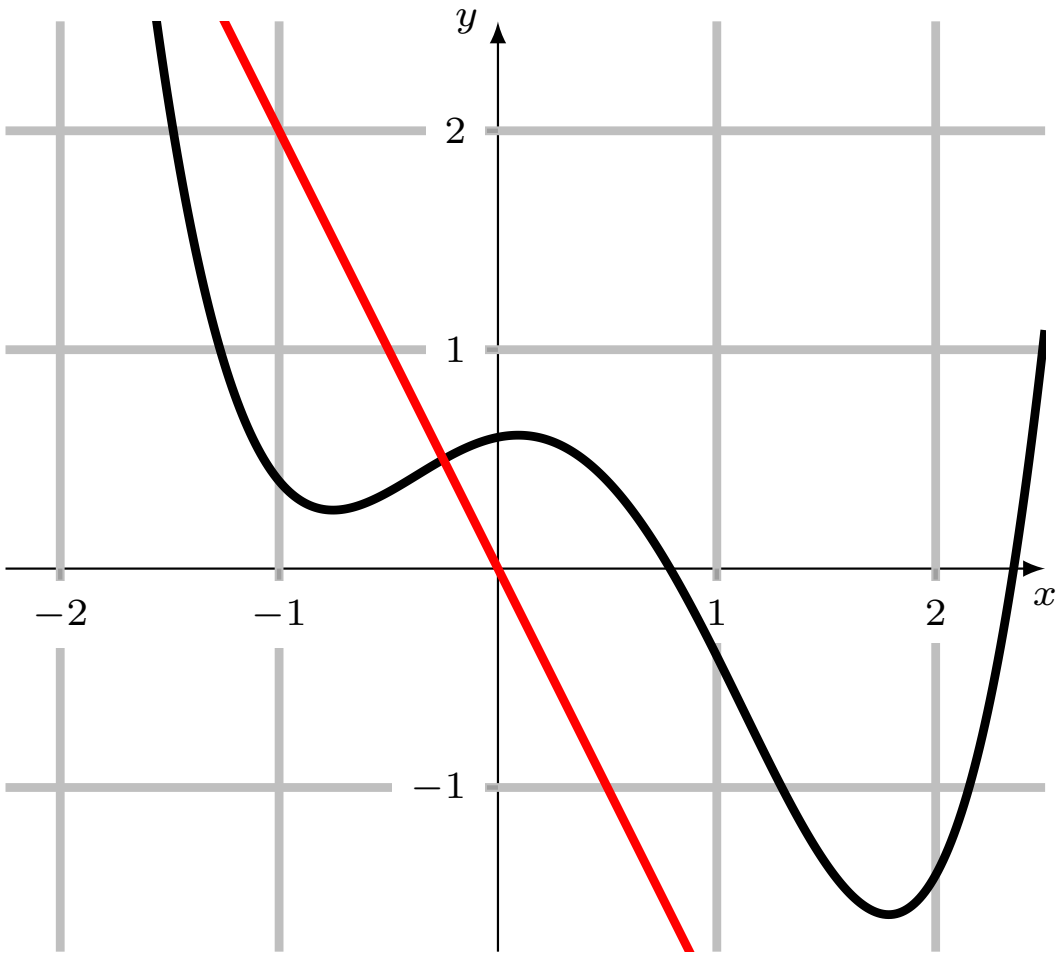

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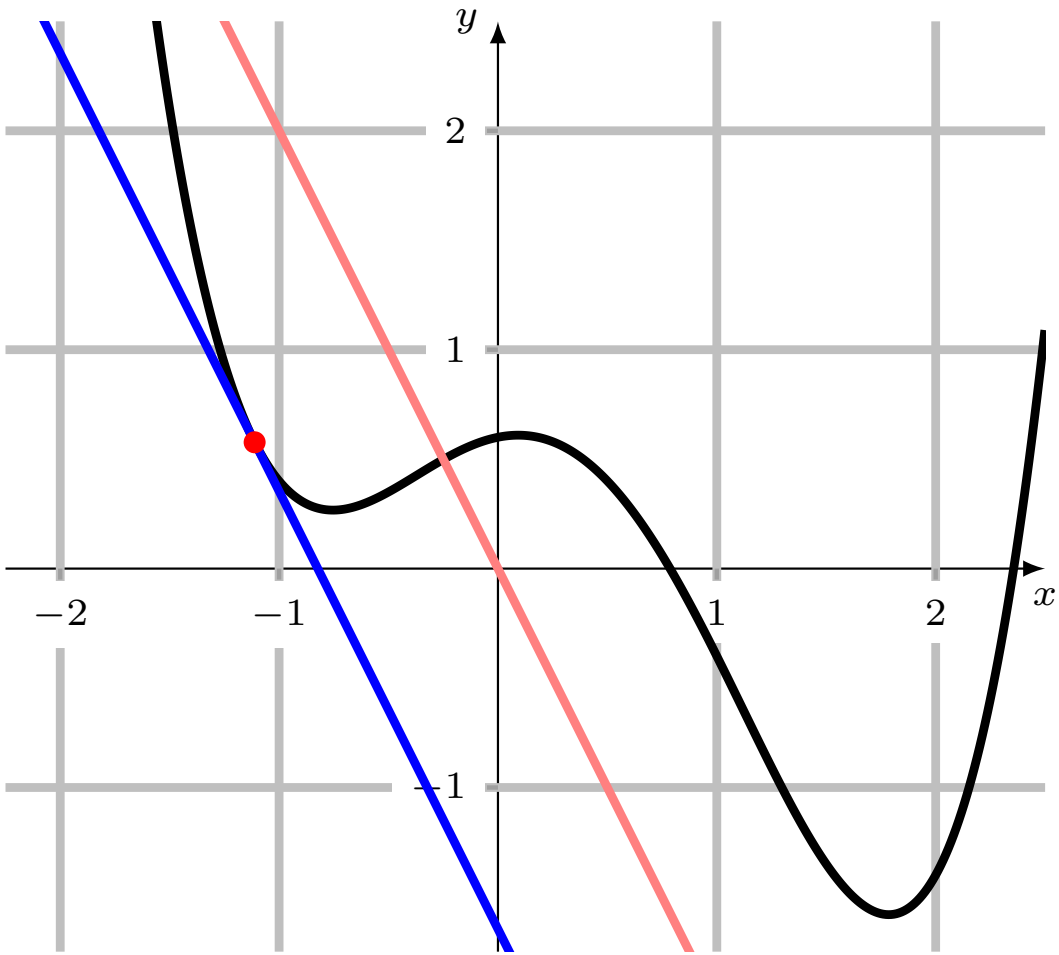

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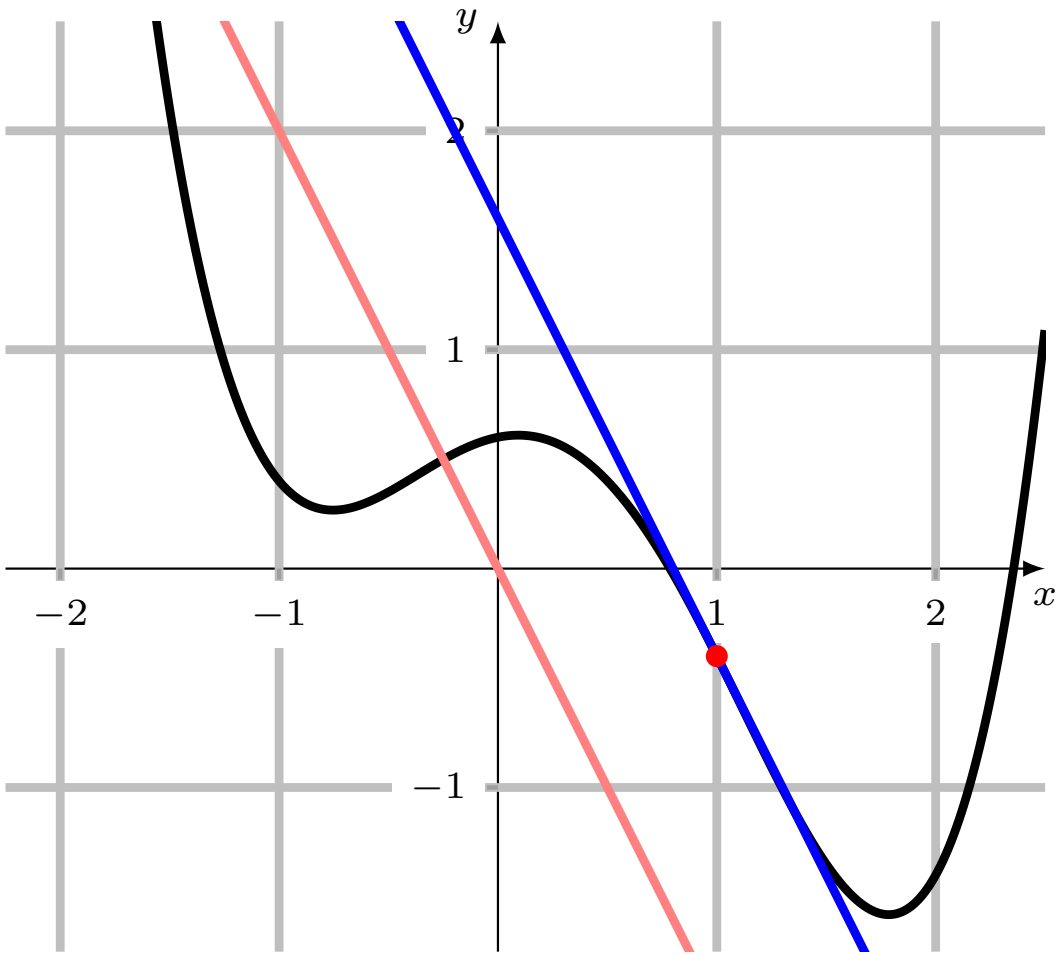

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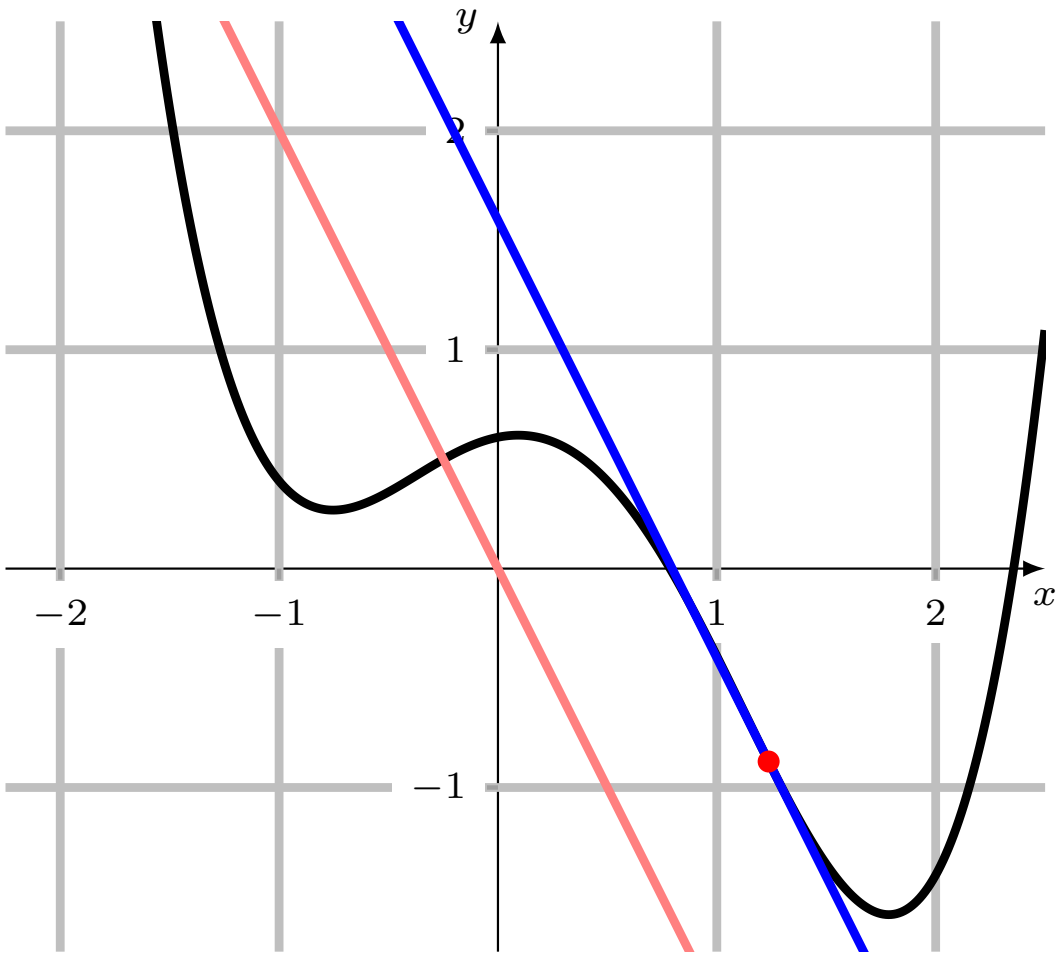

(c) Find a single value of x with $f'(x) = -2$.

Old Final #4 Problem #3(c)

Compute $\dfrac{d}{dx}\Big((2x^k + 5)/x^2\Big)$.

[Here k is a constant.]