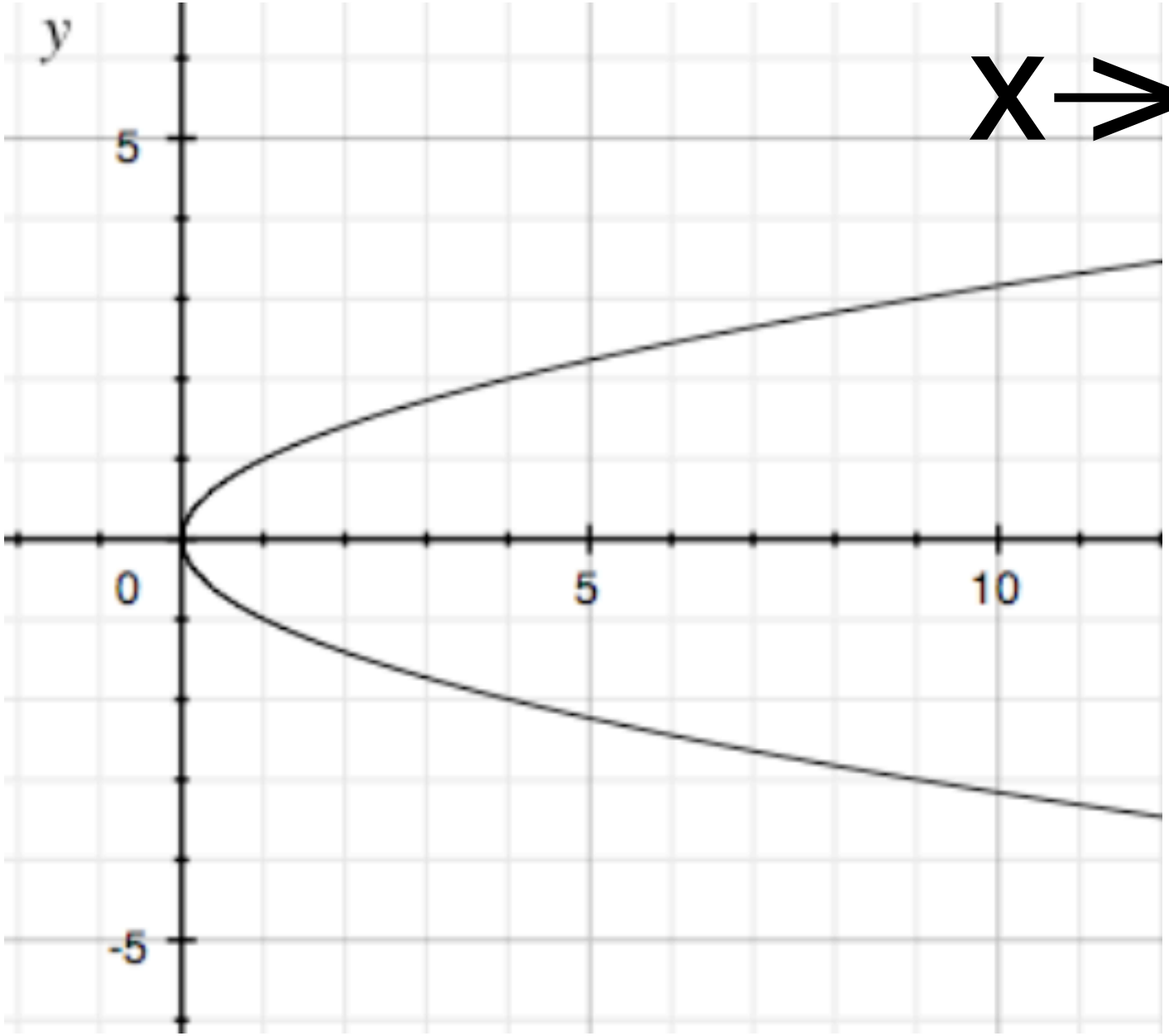
Write the limit definition of the derivative (100)

Find $\lim_{x \to 9} f(x)$



(200)

Find

$$\lim_{x \to \infty} \frac{\log x}{x}$$

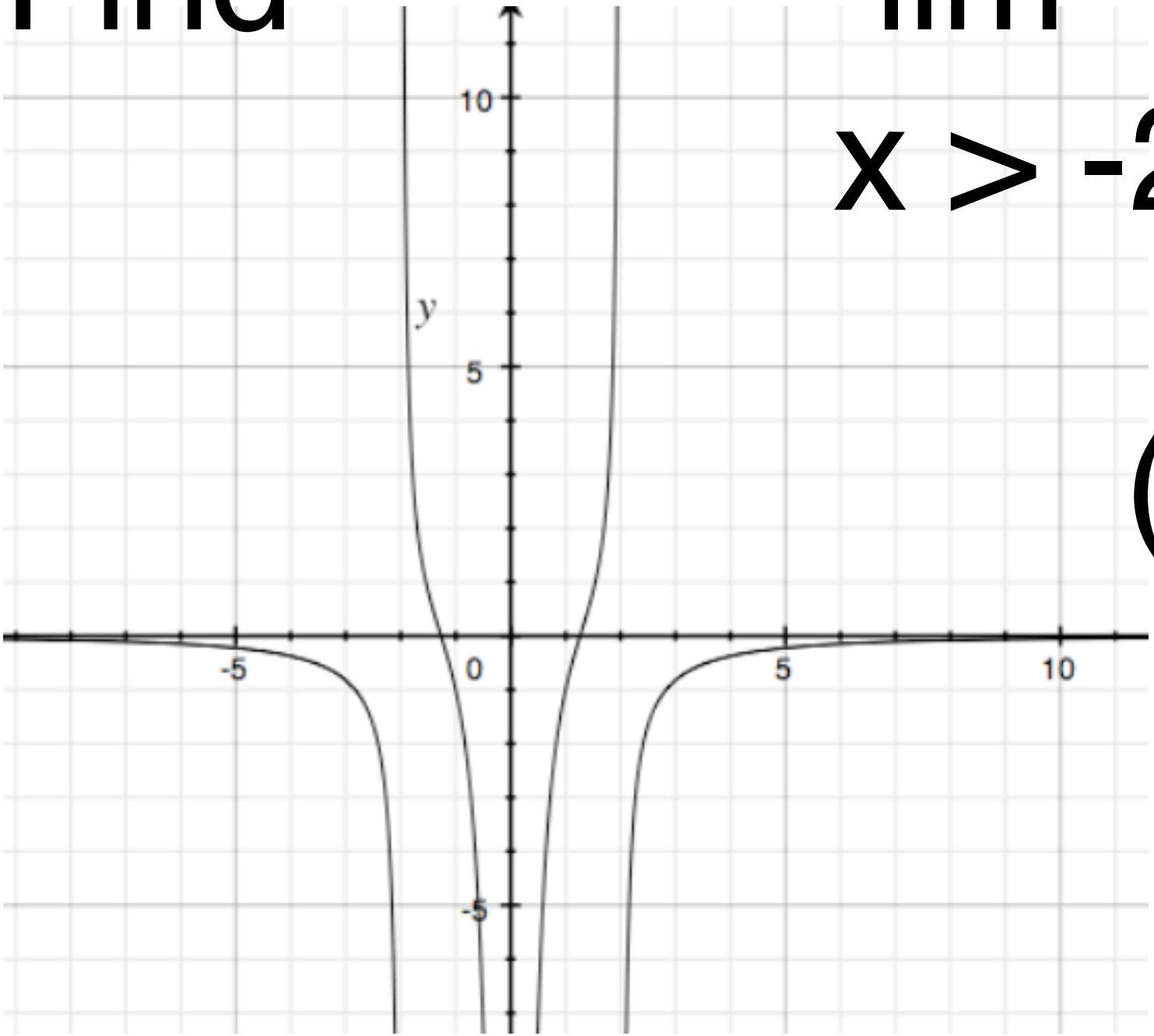
using the calculator
(100)

Your calculator table shows

X	Y_1
4.1	7.6
4.01	7.85
4.001	7.99
3.9	3.1
3.99	3.05
3.999	3.01

Find $\lim_{x > 4} f(x)$ (200)

Find $\lim_{x \to -2^+} f(x)$



(200)

Find

$$\lim_{x \to 0^-} \frac{3x}{x^2}$$

(100)

Find

$$\lim_{x \to 4} \frac{x^4 + 4x^3 - 32x^2}{3x - 12}$$

(300)

Find the derivative of $y = |x|$ at $x = -2$. (300)

Find the tangent line to the curve $y = x^{2/3}$ at $x = 8$.
(500)

An object's position over time is described by $y = 4x^{3/4}$. Find its instantaneous speed at 5 seconds. (200)

When does the curve $y = x^3 - 6x^2 - 20x - 8$

have a slope of -5? (300)

Find the derivative of

$$y = \frac{6\sqrt[5]{x}}{x}$$

(400)

Set up the derivative of

$$y = \frac{1}{x + 3}$$

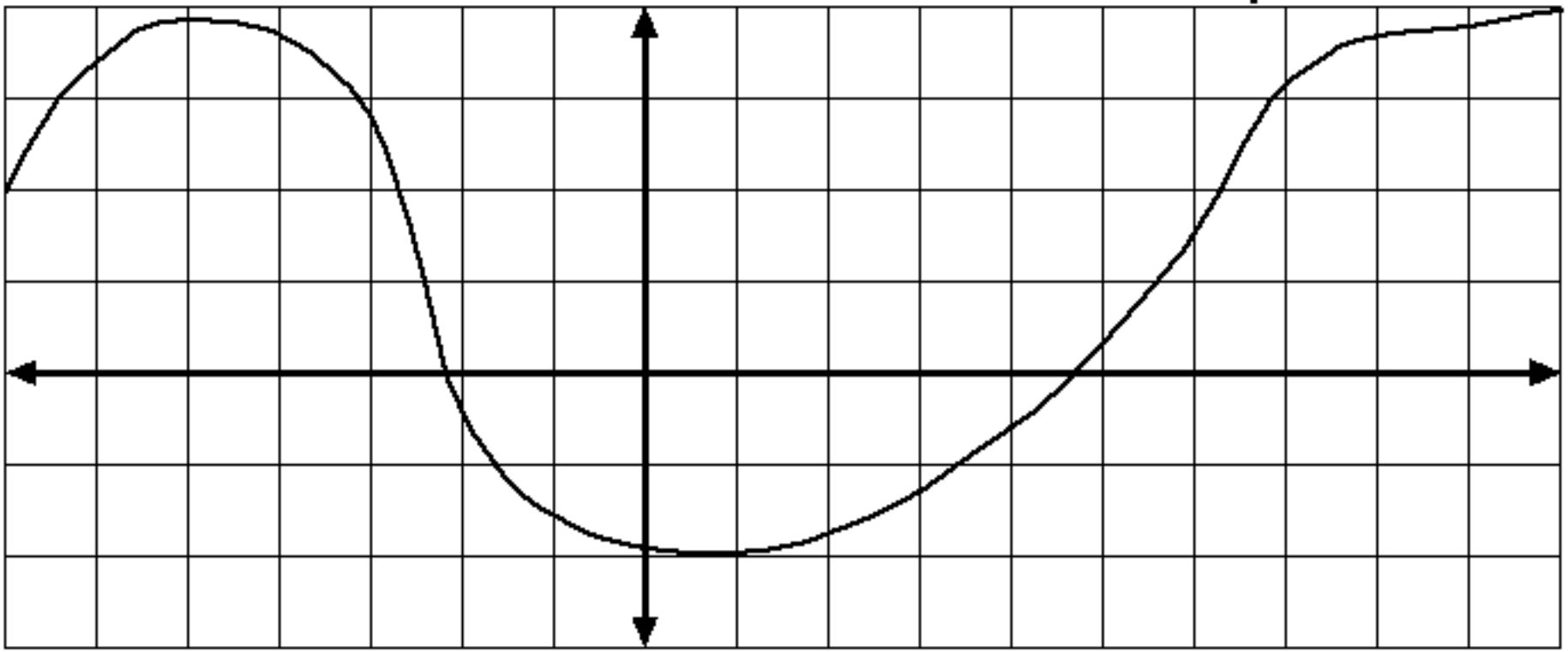
using the definition. (do not solve) (300)

To approximate slope at x = 5, Lily finds two points on the curve: **(5, 8.4)** & **(5.001, 8.403)**. In this calculation, what is the value of:

a) h = ?
b) f(x + h) = ?
c) the derivative = ?
(400)

What do you draw on a graph to approximate the derivative at a point? (100)

G1. For what values of x is the derivative positive?



(100)

Sketch a graph where the first derivative is positive and the second derivative is negative. (200)

The sum of two numbers is 50. What is the maximum product of those two numbers? Show work using CALCULUS. (400)

Find the point on the line $y = 2x - 4$ that is closest to the origin. (500)

The number of pizza slices sold (y) depends on price (x) according to the relationship $y = 200/x^2$. Each slice costs $0.75 to supply. What price would maximize profits? (500)

Find the vertex of the parabola $y = -2x^2 + 5x - 1$ using calculus. (200)

Find the maximum and minimum of the function
$y = 1/3x^3 - 4x^2 + 15x - 3$
using calculus. (300)

Find when the graph of

$$\mathbf{y = x^4 - 2x^3 + 5x^2 - 4}$$

has positive curvature and when it has negative curvature. (300)

The position of an object (y) over time (x) is described by $y = x^5 - 3x^4 + 5x^2 + 1$.
How fast is the object **accelerating** after 3 seconds?
(300)

Prove using the definition that the derivative of the function $y = 10x$ is 10. (300)