Find the derivative of

$y = x^2 \ln (5x - 4)$

(300)

When do the curves $y = x^2 + 8x - 7$ and $y = 1/3x^3 + 4$ have parallel tangent lines?
(300)

Where does the curve $y = \ln(3x - 8)$ have a slope of $1/2$?

(200)

The rate at which Lily is gaining weight fluctuates over time according to the formula $r = t^2 \sin(t^3)$ where t is time in months. Find the amount of weight Lily gains in the first 3 months (t=0 to t=3). (300)

What is the area under the curve $y = \arctan x$ from 0 to 5?
(200)

Find the slope of the graph $x^2y + y^3 = 26$ at the point (3, 2)

(200)

Find the average value of the function
$y = \cos x \sin x$
from $x = 1$ to $x = 6$.
(200)

An object's distance over time is given by the function

$d = -2t^3 + 5t^2 - t + 2$

At what time does the object's maximum velocity occur?

(300)

Set up but do not solve a limit for the derivative of

$y = 3x^2 - 1/x$

using the defintion. (200)

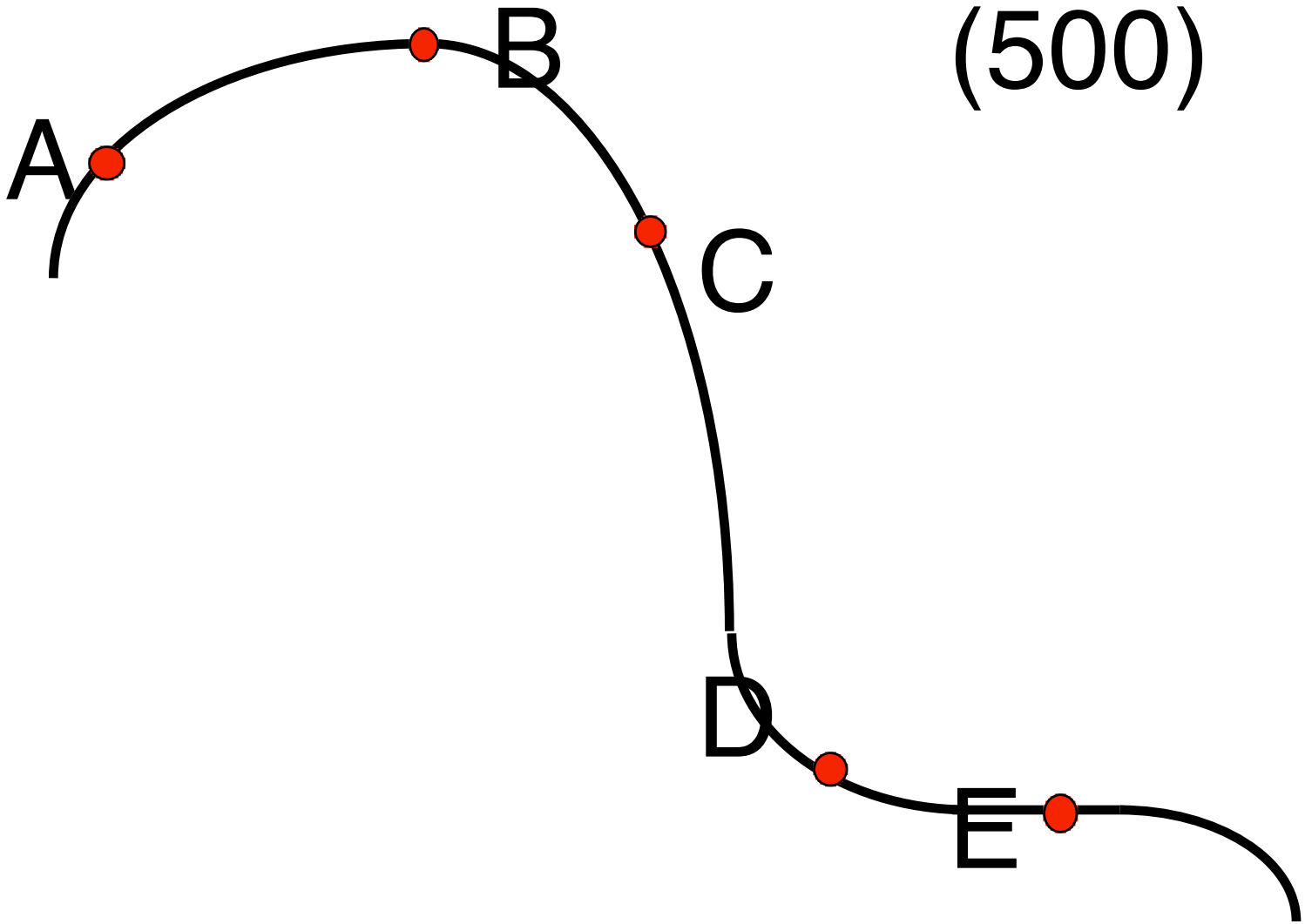
Prove using the limit definition of the derivative that $\mathbf{y = x^2}$ really does have a derivative of 2x. (400)

Find $\lim_{x \to \infty} \frac{x + 4}{x}$

(100)

For each point on the graph, say whether the first derivative and the 2nd derivative are +, -, or 0.

(500)



Find the derivative of

$y = e^{3x \cos x}$

(400)

Use the calculator to approximate the derivative of

$y = 4^{x/2}$ at $x = 5$.

(200)

Given the chart below, if $h(x) = x^2 f(x) + g(x)$, find $h'(2)$.

$f(2)$	$f'(2)$	$g(2)$	$g'(2)$
2	-3	4	-1/2

(500)

Find the slope of $y = 2x \ln x$ at $x = e$.
(200)

The acceleration of an object in m/s^2 is always 4 times the number of seconds that have passed. The object had an initial velocity of 3 m/s and started at a distance of 10 m. Find the object's position at t = 7.
(500)

When does the graph
$y = \ln x$ have a slope of 4?
(100)

The number of words Lily can type per minute is declining as she dozes off according to the formula $wpm = 4/t^2$. How many words did Lily type between t = 1 and t = 10?

(200)

The area of a circle is increasing at a rate of 4 m^2/s when its radius is 10 m. How fast is the radius increasing at that time?
(200)