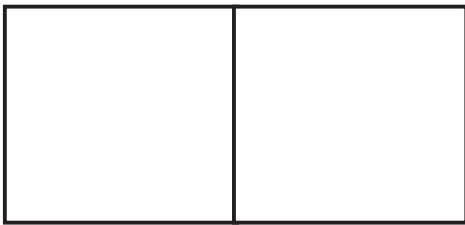


1. If $g(x) = \ln(3x^4 + 5x)$, find $g'(x)$.
2. Find the slope of the tangent line to the curve $x^3 + y^3 - \frac{9}{2}xy = 0$ at $(2,1)$.
3. Find the intervals where the function $f(x) = \frac{x-1}{x^2+3}$ is increasing and decreasing. Find all horizontal and vertical asymptotes of this function.
4. Find $\lim_{x \rightarrow 0} \frac{1 - \cos x}{\sec x}$.
5. Let $f(x) = \sqrt{2 + 7x^3}$.
 - a. Compute $f(1)$.
 - b. Compute $f'(1)$.
 - c. Using the differential or tangent line approximation, find an approximate value for $f(1.08)$.
6. Find $\lim_{x \rightarrow 0^+} \sin x \ln x$.
7. Find the absolute extrema of $f(x) = x^{2/3}(5 - 2x)$ on the interval $[-1, 2]$.
8. A farmer wishes to fence in a rectangular field containing an area of 600 square meters. If the field has a fence down the middle parallel to one side, what is the smallest amount of fencing that he can use?



See next page.

9. A person 6 ft tall stands 10 ft from point P directly beneath a lantern hanging 30 ft above the ground, as shown in the figure below. The lantern starts to fall, causing the person's shadow to lengthen. Given that the lantern falls $16t^2$ ft in t seconds, how fast will the shadow be lengthening when $t = 1$?

