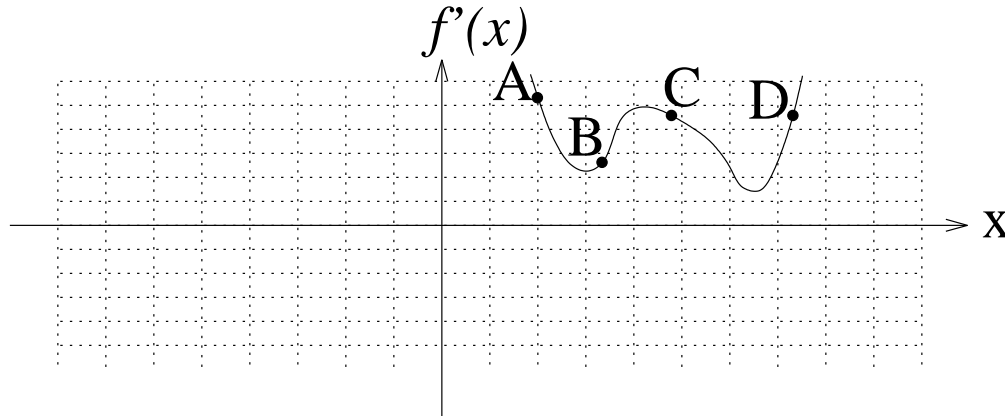


## Applied Calculus I Practice Problems for Quiz # 4

1. Find the equation of the tangent line to the curve  $y = 4x^3 + 1$  at the point  $(2, 33)$ .
2. Find the equation of the tangent line to the curve  $y = 2x^2 - 5x + 3$  at the point where  $x = 3$ .
3. Evaluate the limit

$$\lim_{x \rightarrow \infty} \frac{5x^3 - 2x^2 + 7}{2x - 4x^2 - 7x^3}$$

4. The graph of  $f'(x)$  is shown below. At which of the marked points is (a).  $f(x)$  the least? (b).  $f(x)$  the greatest? (c).  $f'(x)$  the least? (d).  $f'(x)$  the greatest? (e).  $f''(x)$  the least? (f).  $f''(x)$  the greatest?



5. If  $f(x) = \frac{-23}{x^4}$ , find  $f'(2)$ . Also find  $f''(1)$ .
6. If  $h(b) = ab + b^2 - 23b^3$ , find  $h'(2)$ . Also find  $h''(a)$ .
7. If  $f(y) = 6y^2 - 12e^y + x^2$ , find  $f'(x)$  and  $f''(a)$ .
8. If  $f(x) = (2x^2 - 3)(2x + 3)$ , find  $f'(x)$ .
9. If  $s(a) = \frac{-9}{x^3\sqrt{a}}$ , find  $s'(x)$ .
10. Let  $g(x) = 6x^5\sqrt{x} + \frac{3}{x^6\sqrt{x}}$ . Find  $g'(x)$ .
11. Let  $f(x) = \sqrt{3x} + 7 + \frac{4}{x} + \frac{1}{3x^2}$ . Find  $f'(x)$ .
12. A car moves along a straight road and its position at time  $t$  is given by  $s(t) = 2t^3 - 20t^2 + 100t$ . Find the velocity of the car at time  $t = 0$ . At which times is the car at rest? What is the total distance travelled by the car between time  $t = 0$  and  $t = 20$ ?