1.   If $f(x) = x^{-3}$, then the derivative $f'(x)$ equals

a. $-3x^{-2}$ b. x^{-4} c. $3x^{-4}$ d. $-3x^{-4}$ e. $3x^{-2}$

2.   If $f(x) = x^{3/2}$, then $f'(4) =$

a. 8   b. 3   c. 6   d. 12   e. 4/3

3.   Compute $\lim\limits_{x \to 3} \dfrac{1}{x-3}$

a. 1   b. 5   c. undefined   d. 3   e. 0

4. Compute $\lim\limits_{x \to 3} \dfrac{1}{x - 3}$

a. 0   b. 4/0   c. 4/5   d. undefined   e. 4

5. The function $f(x) + \dfrac{x^2 + 2x - 3}{x + 3}$ is discontinous at x =

a. 1   b. 1, – 3   c. 1, – 1   d. 3   e. – 3

6. If $y = x^4 + 4x^3 + 12x^2$, then dy/dx equals

a. $4x^3 + 12x^2 + 24x$ b. $x^3 + 4x^2 + 12x$ c. $4x^3$ d. 0

e. $3x^4 + 8x^3 + 12x^2$

7.   If y = $3\sqrt{2x + 1}$, then dy/dx equals

a. $\frac{1}{3}$ (2x + 1) $^{-1/2}$ b. 6/ $\sqrt{2x + 1}$ c. $\frac{3}{2}$ (2x + 1) $^{-1/2}$

d. 3(2x + 1)$^{1/2}$ e. 3/ $\sqrt{2x + 1}$

8.   Compute the slope of the tangent line to the curve
      y = -1/x   at the point (5, - 1/5).

a. - 1/25   b. - 1/5   c. 1/25   d. undefined   e. 5

9.   If y = 1/x, then d^2 y/dx^2 equals

a. 1/x^2 b. - 1/x^3 c. 2/x^3 d. 2/x^2 e. 1/x^4

10. If $f(t) = 2t^3 - 12t^2 + 18t$, then $f'(t)$ equals 0 for t =

a. 1,3   b. 1   c. 0   d. 0,1   e. 3

11. The cost of producing x units of a product is

$C(x) = 4005 + 2x + 20\sqrt{x}$ dollars . The marginal cost at production level

x + 100 is

12. A vertically moving object has height $h(t) = t^2 + 10t + 11$ feet after t

seconds, $t \geq 0$. What is its velocity when $h(t) = 0$?

a. 11   b. – 12   c. – 1   d. 0   e. 10