

1) $f'(x) = -1/(2x)^{3/2}$
 $f'(2) = -1/8$ (C)

2) $y-2 = 5(x+3)$
 $5x-y = -17$ (B)

3) $y' = 6x^2 - 12x + 5$
 $y'' = 12x - 12 = 0$
 $x=1$
 $y'(1) = -1$ (A)

4) $y' = 3x^2 - 1$ $2x+2 = x^3 - x$
 $y'_1 = 2$ $x^3 - 3x - 2 = 0$
 $y = 2x+2$ $(x+1)(x+1)(x-2) = 0$
 $x=2$
 $(2,6)$
 $|2-6| = 4$ (D)

5) $y' = 2x - \frac{k}{x^2}$
 $y'(3) = 6 - \frac{k}{9} = 0$ $k=54$ (C)

6) $L = (a^{4/3} + b^{4/3})^{3/2}$
 $L = \left[\left(\frac{27}{8}\right)^{4/3} + (8)^{4/3} \right]^{3/2}$
 $L = 125/8$ (D)

7)
 $-\frac{b}{a} = \frac{1}{2-a}$
 $b = \frac{a}{a-2}$
 $A = \frac{1}{2} a \left(\frac{a}{a-2}\right)$
 $A = \frac{a^2}{2(a-2)}$
 $A' = \frac{a^2 - 4a}{(a-2)^2}$
 $a=4 \Rightarrow A = \frac{8}{2} = 4$ (C)

8) $3y^2y' + 2x^2yy' + 2xy^2 - 9x^2 = 0$
 $12y' + 4y' + 8 - 9 = 0$
 $y' = 1/16$
 $M_{NORMAL} = -16$ (A)

9) f' (A)

10) $L^2 = x^2 + y^2$ $\frac{dy}{dt} = 2$ $(1,1)$
 $L^2 = y^4 + y^2$ $L = \sqrt{2}$
 $2L \frac{dL}{dt} = (4y^3 + 2y) \frac{dy}{dt}$
 $\frac{dL}{dt} = \left(\frac{2y^3 + y}{L}\right) \frac{dy}{dt}$
 $\frac{dL}{dt} = 3\sqrt{2}$ (D)

11) $s'(t) = 6t^2 - 18t + 12$
 $s'(t) = 6(t-1)(t-2)$
 $s(0) = -4$ } 5
 $s(1) = 1$ } 1
 $s(2) = 0$ } 5
 $s(3) = 5$ } 5
 $5+1+5 = 11$ (I)

12) $-x \sin y \cdot y' + \cos y = -y \sin x + \cos x \cdot y'$
 $y' = 1$ (A)

13) $h'(x) = f'(g(x)) \cdot g'(x)$
 $h'(1) = f'(g(1)) \cdot g'(1)$
 $f'(g(1)) = -4$
 $g'(1) = 2$ (D)

14) $C'(x) = 1 + 0.002x$
 $C'(500) = 2$ (A)

15) $\lim_{x \rightarrow \infty} \frac{\sqrt{Ax^2+Bx-x} - \sqrt{Ax^2+Bx+x}}{x}$
 $\lim_{x \rightarrow \infty} \frac{(A-1)x^2 + Bx}{\sqrt{Ax^2+Bx+x}}$ $A=1$ A^2+B
 $B=4$ (C)