Quiz #6 Math 101 Semester 101

Name: I.D.

Q1 The linear approximation of $f(x) = e^{\sin x}$ at $a = 0$ is given by

(a) $e^{\sin x} \approx 1 + x$

(b) $e^{\sin x} \approx 1 - x$

(c) $e^{\sin x} \approx 1 + 2x$

(d) $e^{\sin x} \approx 2 + x$

(e) $e^{\sin x} \approx \frac{1}{2} - x$

Q2 Let $y = x^4 + 5x^2 - 2$. Using differentials, the change in y when x changes from 1 to 1.001 is approximately equal to

(a) 0.014

(b) 0.001

(c) 0.01

(d) 0.021

(e) 0.045

Q 3 $(\cosh x - \sinh x)^{30} + (\cosh x + \sinh x)^{30} =$

(a) $2\cosh(30x)$

(b) $2\sinh(30x)$

(c) e^{30x}

(d) $(2\cosh x)^{30}$

(e) 2

Q 4 The base of an isosceles triangle is fixed at $10\,cm$. If the two equal sides are increasing at the rate of $\frac{\sqrt{3}}{5}\,cm/\sec$, then how fast is the area increasing when the two equal sides are equal to the base?

(a) $2\,cm^2/sec.$

(b) $\frac{3}{2}\,cm^2/sec.$

(c) $\frac{5}{2}\,cm^2/sec.$

(d) $1\,cm^2/sec.$

(e) $3\,cm^2/sec.$

Q 5 Sand is being dumped from a truck at a rate of 0.5 ft^3/min to form a pile in the shape of a cone whose height is always equal to the diameter of its base. When the pile is 2 ft high, the height of the pile is increasing at a rate of [The volume of a cone is $V = \frac{1}{3}\pi r^2 h$]

(a) $\frac{1}{2\pi}$ ft/min

(b) $\frac{\pi}{2}$ ft/min

(c) $\frac{2}{\pi}$ ft/min

(d) 2π ft/min

(e) $\frac{1}{2}$ ft/min