AP Calculus Name: _____

Multiple Choice Monday #4 Date: _____ Per: ____

Problem	Section Name
1. The radius of a sphere is measured to be 5 cm with an error of ± 0.1 cm. Use differentials to approximate the error in volume. (A) $\pm\pi\ cm^3$ (B) $\pm 100\pi\ cm^3$ (C) $\pm 10\pi\ cm^3$ (D) $\pm 4\pi\ cm^3$ (E) $\pm 40\pi\ cm^3$	
2. If $f(x) = \begin{cases} 2ax^2 + bx + 6, & x \le -1 \\ 3ax^3 - 2bx^2 + 4x, & x > -1 \end{cases}$ and is differentiable for all real values, then $b =$? (A) -13 (B) 0 (C) 45 (D) 55 (E) 110	
3. An equation of the line normal to the graph of $y = \sqrt{3x^2 + 2x}$ at $(2, 4)$ is (A) $-4x + y = 20$ (B) $4x + 7y = 20$ (C) $-7x + 4y = 2$ (D) $7x + 4y = 30$ (E) $4x + 7y = 36$	
4. If $\cos^2 x + \sin^2 y = y$, then $\frac{dy}{dx} =$ (A) $\frac{2\cos x \sin x}{2\cos y \sin y + 1}$ (B) $\frac{\cos x \sin x}{\cos y \sin y}$ (C) $\frac{2\cos x \sin x}{2\cos y \sin y - 1}$ (D) $\frac{\sin y \cos y}{1 - \cos x \sin x}$ (E) $\frac{2\cos y \sin y}{2\cos x \sin x - 1}$	

5. Find the volume of the region formed by the curve $y = x^2$, the $x - axis$ and the line $x = 3$ when revolved about the $y - axis$. (A) $\frac{3}{2}\pi$ (B) $\frac{9}{2}\pi$ (C) $\frac{27}{2}\pi$ (D) $\frac{81}{2}\pi$ (E) $\frac{243}{2}\pi$	
*6. An open top cylinder has a volume of $125\pi\ in^3$. Find the radius required to minimize the amount of material to make the cylinder. (A) 2 (B) 3 (C) 4 (D) 5 (E) 6	
*7. A 50 ft ladder is leaning against a building and being pulled to the ground, so the top is sliding down the building. If the rate the bottom ladder is being puller across the ground is 12 ft/sec, what is the rate the top of the ladder is sliding down the building when the top is 30 ft from the ground? (A) 12 ft/sec (B) 9 ft/sec (C) 20 ft/sec (D) 9.6 ft/sec (E) 16 ft/sec	
*8. If $f(x) = \left(1 + \frac{x}{20}\right)^5$ find $f''(40)$ (A) 0.068 (B) 1.350 (C) 5.400 (D) 6.750 (E) 540.000	
*9. A particle height at time $t \geq 0$ is given by$h(t) = 100t - 16t^2$. What is its maximum height? (A) 312.500 (B) 156.250 (C) 78.125 (D) 6.250 (E) 3.125	