The University of Jordan		Department of Mathematics
Student's Name:		Instructor's Nume: .....
Student's Number:		Class Time: .....

Second Exam ◇ Calculus I (0301101) ◇ Fall 2016
Note: This exam is composed of 15 questions. You have 60 minutes to finish

For questions 1-12, fill in the blank with the correct answer. Only correct answer count. [1.5 point each].

1. If $4x^2 + 2xy + y^2 = 12$, then $\frac{dy}{dx}$ at the point $(1, 2)$ is equal to .....
2. $\lim_{h\to 0} \dfrac{8(1+h)^8 - 8}{h}$ = ...
3. The equation of the tangent line to the graph of $y = \sin^{-1}\left(\frac{x}{y}\right)$ at the origin .....
4. $\dfrac{d}{dx}\left[\log_3(x^2 + e^2)\right]$ = ...
5. $f(x) = \dfrac{\sin x}{\sqrt{4 - x^2}}$ is continuous on .....
6. $\lim_{x\to \frac{\pi}{2}} e^{\sec(x)}$ = ...
7. If $g(0) = 2, g'(0) = 3$ and $f(x) = \dfrac{4 - 3e^{2x}}{x + g(x)}$, then $f'(0)$ = ...
8. $\lim_{x\to 0} \dfrac{1 - \cos^2(4x)}{x^2}$ = ...
9. If $f(x) = \sec^3(7^x)$, then $f'(x)$ = ...
10. If $f(x) = \ln(x + 8)$, then $\lim_{x\to 2} \dfrac{f(x) - f(2)}{x - 2}$ = ...
11. The vertical asymptote of $f(x) = \dfrac{x - 2}{x^2 - 5x + 6}$ is x = ...
12. $\lim_{x\to -2} \dfrac{2x + 4}{|x| + 2}$ = ...

For questions 13-15, sufficient work must be shown to receive credit.

13. [4 points] Find $\lim_{x\to-\infty}\left(\sqrt{x^2+3x}+x\right)$.

14. [4 points] Use linear approximation to estimate $\sqrt[3]{1001}$.

15. [4 points] Differentiate $f(x)=\dfrac{\sqrt[4]{x}\,\sin^9(x)}{(x-1)^7e^{x^2}}$.