NAME: _____

DATE: _____

REVIEW #2
DERIVATIVES
JCC MAT 1710

Find the derivative of each.

1. $f(x) = x^2 - \frac{4}{x}$
2. $y = \frac{x^2 + 3x}{6}$
3. $f(x) = \frac{1}{\sqrt[3]{x^2}} + 3\cos x$
4. $y = \frac{x^3 + 3x + 2}{x^2 - 1}$
5. $y = \sqrt[3]{x}\left(\sqrt{x} + 3\right)$
6. $h(s) = \left(s^3 - 2\right)^2$
7. $y = x^2 \sin x + 2x\cos x$
8. $y = \sqrt[3]{\left(x^2 + 2\right)^2}$
9. $f(x) = x^2\sqrt{1 - x^2}$
10. $f(x) = \frac{x}{\sqrt[3]{x^2 + 4}}$
11. $y = \left(\frac{3x - 1}{x^2 + 3}\right)^2$
12. $y = \sin 3x^2$

Find $\frac{dy}{dx}$ by implicit differentiation.

13. $x^2 + y^2 = 16$
14. $xy = 4$
15. $x^2 y + xy^2 = 4$
16. $2\sin x \cos y = 1$

Differentiate.

17. $y = \ln\left(x^2 + 1\right)$
18. $y = x\ln x$
19. $f(x) = \ln\sqrt{x + 1}$
20. $y = \ln\frac{x\left(x^2 + 1\right)^2}{\sqrt{2x^3 - 1}}$
21. $f(x) = e^{2x - 1}$
22. $y = \ln\left(\cos 4x\right)$
23. $f(x) = x^{\ln x^2}$
24. $y = \frac{2x^3 + 5}{e^x}$
25. $y = e^{\cot x^2}$
26. $f(x) = \sqrt{4 + e^{2x}}$
27. $y = \left(\ln x\right)e^x$
28. $y = \frac{e^x - e^{-x}}{\ln x}$
29. Find $\frac{dy}{dx}$ using logs: $y = \frac{\left(x^2 - 2\right)^2}{\sqrt{x^2 + 1}}$