Review for Quiz, Trig Derivatives and The Chain Rule

On the quiz, you will be required to show all of your work. This worksheet is optional; it will not be graded. However, the problems are excellent practice, and you are encouraged to ask about any that you do not understand. The quiz will count 50 points, and ***you will not be allowed to use a calculator***.

Find the derivative of each function. Use correct notation.

1. $f(x) = (x^2 + 3)^{29}$
2. $y = \sqrt{2 - 3x^2}$
3. $y = \left(\frac{x-1}{x+1}\right)^2$
4. $y = (\csc x + \cot x)^{-1}$
5. $g(t) = \sin(3t^4)$
6. $h(x) = x^2(4x^3 + 5)^6$
7. $y = \cos^2(3x - 2)$
8. $f(x) = \frac{x}{\sqrt{1 + x^2}}$
9. $f(\theta) = \tan^2 \theta$
10. $r = \sqrt{\theta \sin\theta}$
11. $y = \arctan x$
12. $y = \text{arcsec}(5x^4)$
13. $y = \sin(\arccos x)$
14. $y = x \arccos x - \sqrt{1 - x^2}$
15. $y = \arcsin x + \arccos x$

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

16. $\sqrt{xy} = 1$
17. $x^3 + y^3 = 3xy$
18. $2y = x^2 + \sin y$
19. $1 - xy = x - y$
20. $\tan(x + y) = x$
21. $y = \tan(xy)$

Find the *second* derivative of each function. Use correct notation.

22. $f(x) = (x^2 + 3)^{29}$
23. $g(t) = \sin(3t^4)$
24. $y = \sqrt{2 - 3x^2}$
25. $f(\theta) = \tan^2 \theta$