Section 3.5 Implicit Differentiation DAY TWO

1. Fill out the table of Derivatives of Trigonometric Functions below

   (a) $\frac{d}{dx}(\arcsin x) =$

   (b) $\frac{d}{dx}(\arccos x) =$

   (c) $\frac{d}{dx}(\arctan x) =$

   (d) $\frac{d}{dx}(\text{arccot } x) =$

   (e) $\frac{d}{dx}(\text{arcsec } x) =$

   (f) $\frac{d}{dx}(\text{arccsc } x) =$

2. Find dy/dx by implicit differentiation.

   (a) $x^4 + x^2y^2 + y^3 = 5$

   (b) $\tan(x - y) = \frac{y}{1+x^2}$

   (c) $x\sin(y) + y\sin(x) = 1$

3. Use implicit differentiation to find an equation of the tangent line to the curve at the given point

$$x^2 + 2xy + 4y^2 = 12, \quad (2, 1) \quad \text{(ellipse)}$$

4. Find the derivative of the given function. Simplify where possible.

   (a) $y = (\arctan x)^2$

   (b) $y = x \arcsin x + \sqrt{1 - x^2}$

5. Find y'' by implicit differentiation for the given curve $x^2 + 4y^2 = 4$.