Sheet # 363: PREPARATION FOR DERIVATIVES OF INVERSES & IMPLICIT DIFFERENTIATION.

NAME: KEY Period: ____

1. $\sin\theta = x$ FIND $\cos\theta$ IN TERMS OF X. HINT: USE PYTHAGOREAN IDENTITY FOR $\cos\theta$, $\sin\theta$.

$\cos^2\theta + \sin^2\theta = 1$

$\cos^2\theta + x^2 = 1$

$\cos^2\theta = 1 - x^2$

$\boxed{\cos\theta = \sqrt{1-x^2}}$

2. $\tan\theta = x$ FIND $\sec^2\theta$ IN TERMS OF X.

$\frac{\cos^2\theta}{\cos^2\theta} + \frac{\sin^2\theta}{\cos^2\theta} = \frac{1}{\cos^2\theta}$

$1 + \tan^2\theta = \sec^2\theta$

$\boxed{\sec^2\theta = 1 + x^2}$

3. $\frac{d}{dx}[g(x)]^2 = \boxed{2g(x) \cdot g'(x)}$

HINT: USE CHAIN RULE. WHAT IS f?

4 and 5: Let $u = g(x)$.

4. $\frac{d}{du}u^2 = \boxed{2u}$

5. $\frac{d}{dx}u^2 = \boxed{2u \cdot u'}$

6. $\frac{d}{dx}y^2 = \boxed{2y \cdot y'}$

7. $\frac{d}{dx}(xy) = \boxed{x'y + xy' = y + xy'}$

8. $\frac{d}{dx}\sqrt{x} = \boxed{\frac{1}{2\sqrt{x}}}$

9. If $y = \sqrt{x}$

$\frac{d}{dx}y = \boxed{\frac{1}{2y}}$ (IN TERMS OF y)