

Math 180
Spring 2010

Name _____

Homework #7
Due Tuesday, April 6
No late papers accepted! No excuses!

1. Find each derivative.

a) $y = \arcsin\left(\frac{1}{\sqrt{x}}\right), x > 1$

b) $y = 8^{-x}$

c) $y = 2\sqrt{x-1} \operatorname{arcsec} \sqrt{x}$

d) $y = \ln \arccos x$

e) $y = (1 + x^2)^{e^{\arctan x}}$

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

a) $x \arcsin y = 1 + x^2$

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

3. Find equations for the lines that are tangent and normal to the curve at the given point.

$$x + \sqrt{xy} = 6$$

$$(4,1)$$

4. Find an equation for the line in the xy -plane that is tangent to the curve at the point corresponding to the give value of t . Also, find the value of $\frac{d^2y}{dx^2}$.

$$x = \frac{1}{2} \tan t$$

$$y = \frac{1}{2} \sec t$$

$$t = \pi/3$$

5. Use logarithmic differentiation to find the derivative.

a) $y = (\sin x)^x$

b) $y = \frac{2(x^2 + 1)}{\sqrt{\cos(2x)}}$

6. Water drains from a conical tank whose radius is 4 feet and height is 10 feet at the rate of 5 cubic feet per minute. How fast is the water level dropping when the height is 6 feet?