1. Determine the derivatives of the following functions:

(a)
$$f(x) = \arcsin(4x^2)$$

(b)
$$g(s) = \arccos(s) \ln(2s)$$

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

(d)
$$f(x) = \arcsin(e^x)$$

(e)
$$y = \arctan \sqrt{\frac{1-x}{1+x}}$$

(f)
$$y = \arctan\left(\frac{x}{a}\right) + \ln\sqrt{\frac{x-a}{x+a}}$$

2.	Find the absolute	maximum a	and absolute r	ninimum of the	e function $f(x)$	$e(x) = e^x - ex$ o	n the interval (0 < x < 5

3. Find
$$y'$$
 if $\arctan(x^2y) = 2x + xy$.

4. Find and equation of the tangent line to the curve
$$y=3\arccos(x/2)$$
 at the point $(1,\pi)$.

5. Show that there is exactly one root of the equation
$$ln(x) = 3 - x$$
 and that it lies between 1 and e.

6. Evaluate the following integrals.

(a)
$$\int \frac{1}{(y-1)^2+1} dy$$

(b)
$$\int_0^{\sqrt{3}/4} \frac{1}{1 + 16x^2} dx$$

(c)
$$\int \frac{1+x}{1+x^2} dx$$

(d)
$$\int_0^{\pi/2} \frac{\sin x}{1 + \cos^2 x} dx$$

(e)
$$\int \frac{1}{\sqrt{1-x^2}\arcsin x} dx$$

(f)
$$\int_{1/\sqrt{3}}^{\sqrt{3}} \frac{8}{1+x^2} dx$$

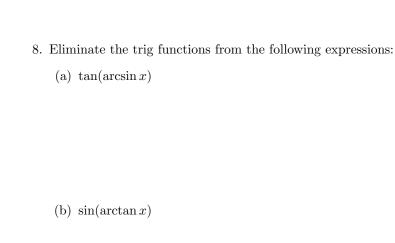
$$(g) \int \frac{e^{2x}}{\sqrt{1 - e^{4x}}} dx$$

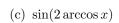
$$(h) \int \frac{x}{1+x^4} dx$$

(i)
$$\int \frac{1}{\sqrt{a^2 - x^2}} dx \text{ for } a > 0$$

(j)
$$\int \frac{\sin(\arctan(x))}{2 + 2x^2} dx$$

7. Find
$$\frac{dy}{dx}$$
 if $\arcsin(xy) + y^2 = \frac{y}{x}$.





9. If
$$g(x) = x \arcsin(x/4) + \sqrt{16 - x^2}$$
, find the equation of the line tangent to $g(x)$ at $x = 2$.

10. Sketch the function
$$f(x) = \arctan(x) - x$$
 using the techniques you learned in Chapter 3.