MAT122 - Homework 7 **Name**_____

Due March 24

Work your answers on a separate sheet and then transcribe them neatly to this worksheet. Show your work!

For problems 1 through 5 use repeated applications of the chain rule to find

1. y' where $y = \sin(\sin(\sin(x)))$

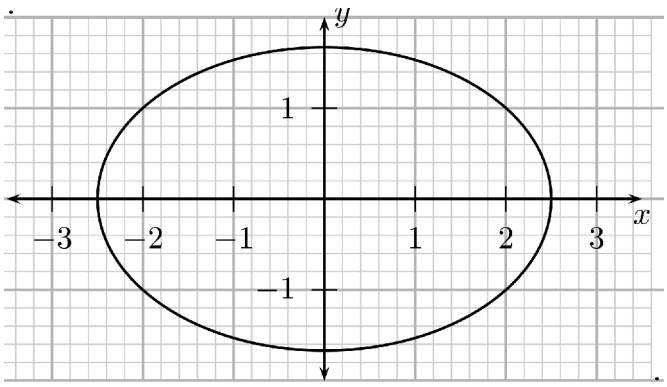
2. $f'(x)$ where $f(x) = \arctan(\sqrt{x})$.

3. $f'(4)$ where $f(x) = \arctan(\sqrt{x})$.

4. $\frac{da}{db}$ where $a = \ln(b^2)$.

5. $\frac{d}{dx}\arcsin(\cos(y))$ assuming y is a function of x. Use trig identities to simplify the derivative.

For problems 6 through 9 Consider the ellipse given by $4x^2 + 9y^2 = 25$**.**



6. Sketch the tangent line through the point (2,-1).

7. Find the slope of the tangent line by solving $4x^2 + 9y^2 = 25$ for y and computing $y' = \frac{dy}{dx}$.

8. Find the slope of the tangent line by differentiating $4x^2 + 9y^2 = 25$ implicitly and solving for y'.

9. Write the equation of the tangent line to $4x^2 + 9y^2 = 25$ through the point (2,-1)

10. Use a tangent line approximation at 8 to estimate $\sqrt{70}$.