

Name \_\_\_\_\_

- You have 20 minutes
- No calculators
- Show sufficient work

1. (2 points) Compute  $f'(x)$  given that  $f(x) = \arctan(\sqrt{x^2 + 3})$ .

2. (3 points) Given  $w(x) = \ln(5 \sin(x) + x^3 + 9)$ , find its second derivative  $w''(x)$ .

3. (3 points) Find the equation of the line tangent to the given curve at the point  $(-1, 2)$ .

$$3x^2y + 2 = (2x + y^2)^3$$

4. (2 points) Compute  $\frac{dy}{dx}$  for the given function. Write your answer completely in terms of  $x$ .

$$y = (x^2 + 4)^{x^3}$$