1. Find the slope of a line tangent to \( y = \frac{2 \sin 3x}{x} \) at \( x = \frac{\pi}{6} \).

2. \( \tan(\arcsin \frac{1}{\sqrt{2}}) = \)

3. Find the magnitude and direction of the velocity of the object which moves so that \( x = \sin(2\pi t) \), \( y = 2 \cos^2(\pi t) \) at \( t = \frac{13}{12} \).

4. Find the area of the largest rectangle which can be inscribed under the curve \( y = e^{-x^2} \) in the first quadrant.
5. \( y = x^2(e^{\cos^2 x})^2, \ y' = \)

6. \[ \int_{0}^{\pi/6} \frac{\tan x}{\cos^2 x} \, dx \]

7. \[ \int \frac{2x + \sin 2x}{x^2 + \sin^2 x} \, dx \]

8. \[ \int \frac{1 - \sin x}{x + \cos x} \, dx \]

9. \[ \int (\sin x + \cos x)^2 \, dx \]

10. \[ \int \frac{4x \, dx}{\sqrt{3 - 2x^2}} \]