1. Which of the following is the derivative of the function $f(x) = \ln(\sin(x))$?

(A) $1/\cos(x)$

(B) $\sin(x)/\cos(x)$

(C) $\cos(x)/\sin(x)$

(D) None of the above

2. True or False?

If f is the function defined by

$$f(x) = x^{\cos(x)}$$

then $f'(\pi) = \dfrac{-1}{\pi^2}$.

3. Suppose

$$f(x) = \frac{4}{1+x^2}.$$

What is the slope of the tangent line to f^{-1} at the point $P = (2, 1)$?

(A) -2

(B) $-1/2$

(C) $-16/25$

(D) None of the above

4. What is the slope of the tangent line to the graph of $f(x) = x^2 \sin(x)$ at $x = \pi/2$?

(A) 0

(B) π

(C) $(\pi/2)^2$

(D) None of the above

5. True or False?

The tangent line to the curve defined by

$$(x-1)^2(x^2+y^2) = 2x^2$$

at the two points where $x = 1 \pm \sqrt{2}$ is vertical.