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?

The tangent line to the graph of the function

$$f(x) = \sin(\cos(\sin(x)))$$

at $x = 0$ is horizontal.

3. True or False?

If f is the function defined by

$$f(x) = \sqrt{1 + \sqrt{1 + x}},$$

then $f'(0) = \dfrac{1}{4\sqrt{2}}$.

4. True or False?

If f is differentiable and even, then f' is odd.

5. True or False?

If f is the function defined by

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

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

6. True or False?

The tangent line to the graph of the function $f(x) = \log_2(x)$ at $x = \log_2(e)$ has slope 1.

7. 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.

8. True or False?

If $f(x) = x^{x^x}$, then $f'(e) > 0$.