CALCULUS
Derivatives of trigonometric functions
NEW
0360-1. Differentiate \( f(x) = -\pi x^8 - e^3 \cos x \).

0360-2. Differentiate \( u(q) = -q^9 + 2e^q + (\sin(2)) - \tan q \).

0360-3. Differentiate \( p(t) = t^4 \sec t \).

0360-4. Differentiate \( B(w) = \frac{4e^w - \csc w}{\tan w} \).

0360-5. Differentiate \( F(x) = \frac{x^2e^x - \tan x}{e^x \cot x} \).
Find an equation of the tangent line to the graph of
\[ y = \frac{4e^{-\pi/2}e^x - \cot x}{2e^{-\pi/2}e^x \sin x} \]
at the point \((\pi/2, 2)\).
A laser pointer, resting on the ground, is casting **red light** on a **blue wall** that is 14 ft away, as in the diagram. It is being turned upward, and its angle with the ground is denoted \( \alpha \) (radians). Let \( y \) denote the distance from the point of light on the wall straight down to the ground.

**a. Find** a formula for \( y \) in terms of \( \alpha \).

**b. At the moment when** \( \alpha = \pi/3 \),

**i. compute** \( y \) and

**ii. compute** how fast \( y \) is changing with respect to \( \alpha \).