

# CALCULUS

## Derivatives of trigonometric functions

### OLD2

0360-1. Differentiate  $f(x) = 2x^6 - 3 \cos x$ .

OLD2

0360-2. Differentiate

OLD2

$$u(r) = 2r^8 - 5e^r + \pi^2 - \cot r.$$

0360-3. Differentiate  $p(t) = t^3 \csc t$ .

OLD2

0360-4. Differentiate  $A(z) = \frac{e^z - \cot z}{(\sec z)(\tan z)}$ .

OLD2

0360-5. Differentiate  $F(x) = \frac{xe^x - \cos x}{e^x \csc x}$ .

OLD2

0360-6. Find an equation of the tangent line  
OLD2  
to the graph of  $y = \frac{4e^{-\pi}e^x - \tan x}{2e^{-\pi}e^x \cos x}$   
at the point  $(\pi, -2)$ .

0360-7. A laser pointer, resting on the ground, is casting red light on a blue wall that is 12 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.

- Find a formula for  $y$  in terms of  $\alpha$ .
- At the moment when  $\alpha = \pi/4$ ,
  - compute  $y$  and
  - compute how fast  $y$  is changing with respect to  $\alpha$ .

