

This quiz is due on Wednesday, July 3.

1. Find $f'(x)$ when $f(x) = \sin(e^{2\ln x})$, without first simplifying $f(x)$. Simplify the derivative.

(*Hint: Use the chain rule. What is $e^{2\ln x}$ equal to?*)

2. A beacon that makes one revolution every 12 seconds is located on a ship anchored 4 kilometers from a straight shoreline. How fast is the beam moving along the shoreline when it makes an angle of 30° with the shore?

(*This is a related rates problem.*)

3. Find dy/dx when

$$x^2 = \frac{x+y}{x-y}.$$

(*Hint: Use implicit differentiation.*)

4. Find $f'(x)$ when

$$f(x) = \log_7 \left(\frac{x-1}{x+1} \right).$$

(*Hint: Convert to base e and then differentiate.*)

5. Find dy/dx when

$$y = \sqrt{\frac{(5x+4)(9x-1)}{x^2+1}}$$

(*Hint: Use logarithmic differentiation.*)