Bellwork 10/18

Find the equation for the line tangent to $f(x) = \frac{e^x}{x}$ at $x = 3$.

reset

Bellwork 10/18 - Solution

$$f'(x) = \frac{xe^x - e^x}{x^2}$$

Point-Slope Form: $y - f(3) = f'(3)(x - 3)$

$$y = \left(\frac{3e^3 - e^3}{9}\right)(x - 3) + \frac{e^3}{3}$$

$$\boxed{y = \left(\frac{2e^3}{9}\right)x - \frac{e^3}{3}}$$

Exercise 1

$$f(x) = \frac{\sin(x)}{x} + x\cos(x)$$

Find $f'(x)$

Exercise 1 - Solution

$$f'(x) = \boxed{\frac{x\cos(x) - \sin(x)}{x^2} - x\sin(x) + \cos(x)}$$

Exercise 2

$$g(x) = e^x \cot(x) - \frac{\sec(x)}{x^2}$$

Find $g'(x)$

Exercise 2 - Solution

$$g'(x) = \boxed{e^x \cot(x) - e^x \csc^2(x) - \left[\frac{x^2 \sec(x)\tan(x) - 2x\sec(x)}{x^4}\right]}$$

Exercise 3

$$h(x) = \frac{x^2 \tan(x) + e^x \csc(x)}{e^x}$$

Find $h'(x)$

Exercise 3 - Solution

$$h(x) = \frac{x^2 \tan(x)}{e^x} + \csc(x)$$

$$\implies h'(x) = \frac{e^x[2x\tan(x) + x^2\sec^2(x)] - x^2 e^x \tan(x)}{e^{2x}} - \csc(x)\tan(x)$$

$$h'(x) = \boxed{\frac{2x\tan(x) + x^2\sec^2(x) - x^2\tan(x)}{e^x} - \csc(x)\tan(x)}$$