

# MTH 140 - Quiz 7

Sunday, March 31, 2024 4:18 PM

$$\frac{d}{dx} \left[ \frac{x e^x}{\ln(x)} \right] \stackrel{\text{quotient rule}}{=} \frac{\ln(x) \frac{d}{dx} [x e^x] - x e^x \frac{d}{dx} [\ln(x)]}{(\ln(x))^2}$$

product rule

$$\frac{d}{dx} [x e^x] = \frac{d}{dx} [x] e^x + x \frac{d}{dx} [e^x]$$
$$= 1 e^x + x e^x = e^x (1+x)$$

$$= \frac{\ln(x) e^x (1+x) - x e^x \left(\frac{1}{x}\right)}{(\ln(x))^2}$$

$$= \frac{\ln(x) e^x (1+x) - e^x}{(\ln(x))^2}$$