

Summary of derivatives we know thus far

$$\frac{d}{dx} x^n = nx^{n-1}$$

$$\frac{d}{dx} e^x = e^x$$

$$\frac{d}{dx} \sin(x) = \cos(x)$$

$$\frac{d}{dx} \ln(x) = \frac{1}{x}$$

$$\frac{d}{dx} \cos(x) = -\sin(x)$$

$$\frac{d}{dx} b^x = \ln(b) b^x$$

$$(u v)' = u'v + uv'$$

$$\left(\frac{u}{v}\right)' = \frac{u'v - uv'}{v^2}$$

$$\frac{d}{dx} f(g(x)) = f'(g(x)) \cdot g'(x)$$

Find the derivative of each function

1. $f(x) = (3x^2 + 2)^{14}$

2. $f(x) = (\sin(x))^3$

3. $f(x) = x^2 \sin(x^3)$

4. $f(x) = \sqrt{\ln(x^2 + 2x)}$

5. $f(x) = \tan(x)$

Hint: $\tan(x) = \frac{\sin(x)}{\cos(x)}$

6. $f(x) = \tan(\ln(x))$

7. $f(x) = \sec(x)$

Hint: $\sec(x) = \frac{1}{\cos(x)}$

8. $f(x) = \ln(\cos(x))$