Derivatives of trigonometric functions:

a) *If* $f(\theta) = \sin^3(4\theta)$ *find* $f'(\theta)$.

$$= \left[\sin(4\theta) \right]^3 \cdot \qquad f'(\theta) =$$

$$3 \left[\sin(4\theta) \right]^2 \cdot \left[\cos(4\theta) \right] \cdot 4$$

$$= 12 \sin^2(4\theta) \cdot \cos(4\theta)$$

b) *If* $w = \ln(\tan 2x)$ *find* w'.

$$w' = \frac{1}{\tan 2x} \cdot \sec^2(2x) \cdot 2$$

c) If $s = e^{2t} \cos(3t)$ find $s'(t)$.

$$s'(t) = e^{2t} \cdot \left[-\sin(3t) \cdot 3 \right] +$$

$$\cos(3t) \cdot e^{2t} \cdot 2 \ .$$

d) If $g(x) = \dfrac{\sec(3x)}{\sqrt{x^2+7}}$ find $g'(x)$.

$$g'(x) = \frac{\sqrt{x^2+7} \cdot \left[\sec(3x) \cdot \tan(3x) \cdot 3 \right] - \sec(3x) \cdot \dfrac{1}{2\sqrt{x^2+7}} \cdot 2x}{\left(x^2+7\right)}$$