

$$(a) f'(x) = (\sqrt{x})'(x^2+2) + \sqrt{x} (x^2+2)'$$

$$= \frac{1}{2} x^{-1/2} (x^2+2) + \sqrt{x} (2x)$$

$$(b) g'(x) = \frac{(x^{3/2}+2)(x+3)' - (x+3)(x^{3/2}+2)'}{(x^{3/2}+2)^2}$$

$$= \frac{(x^{3/2}+2)(1) - (x+3)\left(\frac{3}{2}x^{1/2}\right)}{(x^{3/2}+2)^2}$$

$$(c) h'(x) = \frac{\sqrt{x^2+1} (e^{-5x^3})' - e^{-5x^3} (\sqrt{x^2+1})'}{(\sqrt{x^2+1})^2}$$

$$= \frac{\sqrt{x^2+1} e^{-5x^3} (-5x^3)' - e^{-5x^3} \cdot \frac{1}{2} (x^2+1)^{-1/2} (x^2+1)'}{(\sqrt{x^2+1})^2}$$

$$= \frac{\sqrt{x^2+1} e^{-5x^3} (-15x^2) - e^{-5x^3} \cdot \frac{1}{2} (x^2+1)^{-1/2} \cdot 2x}{(\sqrt{x^2+1})^2}$$