

$$b) d) 3x^2 - 10x + 6$$

$$f'(x) = 6x - 10$$

$$b) 3\sqrt{x} - \frac{2}{x^2}$$

$$= 3x^{1/2} - 2x^{-2}$$

$$f'(x) = 3 \times \frac{1}{2} x^{-1/2} - 2(-2)x^{-3}$$

$$= \frac{3}{2} x^{-1/2} + 4x^{-3}$$

$$= \frac{3/2}{\sqrt{x}} + \frac{4}{x^3}$$

$$c) x(x+1)(x+2)$$

$$= (x^2+x)(x+2)$$

$$= x^3 + x^2 + 2x^2 + 2x$$

$$= x^3 + 3x^2 + 2x$$

$$f'(x) = 3x^2 + 6x + 2$$

$$d) \frac{x}{x+1}$$

$$= x(x+1)^{-1}$$

$$f'(x) = x(-1)(x+1)^{-2} + (x+1)^{-1}$$

$$= -x(x+1)^{-2} + (x+1)^{-1}$$

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

$$e) \sqrt{1+x^2}$$

$$= (1+x^2)^{1/2}$$

$$f'(x) = \frac{1}{2} (1+x^2)^{-1/2} \cdot 2x \quad \text{(using chain rule)}$$

$$= \frac{1}{2} \cdot \frac{2x}{\sqrt{1+x^2}}$$

$$= \frac{x}{\sqrt{1+x^2}}$$