Problem 1: $f(x) = 3x^2 + 5x - 7$

$f(x) = 3x^2 + 5x - 7$

$f'(x) = 6x + 5$

Problem 2: $f(x) = \sqrt{x}$

$f(x) = \sqrt{x} = x^{\frac{1}{2}}$

$f'(x) = \dfrac{1}{2} \cdot x^{\frac{1}{2}-1}$

$= \dfrac{1}{2} \cdot x^{-\frac{1}{2}}$

$= \dfrac{1}{2} \cdot \dfrac{1}{x^{\frac{1}{2}}}$

$= \dfrac{1}{2} \cdot \dfrac{1}{\sqrt{x}}$

$= \dfrac{1}{2\sqrt{x}}$

Problem 3: $f(x) = x^2 \sin(x)$

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

$f'(x) = (x^2)' \sin(x) + x^2 \sin'(x)$

$= 2x \sin(x) + x^2 \cos(x)$

Problem 4: $f(x) = \sin(3x^2 + 2x)$

Set $g(x) = 3x^2 + 2x$

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

$f(x) = \sin(3x^2 + 2x) = \sin(g(x))$

$f'(x) = f'(g(x)) \cdot g'(x)$

$= \sin'(g(x)) \cdot g'(x)$

$= \cos(3x^2 + 2x) \cdot 6x + 2$