1. Use the limit definition of the derivative to find \( f'(x) \) for \( f(x) = 3x^2 - 5x \).

\[
 f'(x) = \lim_{\Delta x \to 0} \frac{f(x+\Delta x) - f(x)}{\Delta x} = \lim_{\Delta x \to 0} \frac{3(x+\Delta x)^2 - 5(x+\Delta x) - (3x^2 - 5x)}{\Delta x}
\]

\[
 = \lim_{\Delta x \to 0} \frac{3x^2 + 6x\Delta x + 3\Delta x^2 - 5x - 5\Delta x - 3x^2 + 5x}{\Delta x}
\]

\[
 = \lim_{\Delta x \to 0} (6x + 3\Delta x - 5) = 6x - 5
\]

2. Find the derivative:

(a) \( \frac{d}{dx}(4x^3 - 5x^2 - 3x + 7) \)

\[
= 12x^2 - 16x - 3
\]

(b) \( \frac{d}{dt}(4e^t - 5 \sin t + 2 \cos t) \)

\[
= 4e^t - 5 \cos t - 2 \sin t
\]

3. Find the derivative:

(a) \( \frac{d}{dx} \left( \frac{x^2 - 3x}{7x + 2} \right) \)

\[
= \frac{(7x+2)(2x-3) - (x^2-3x)}{(7x+2)^2} \frac{7}{7}
\]

(b) \( \frac{d}{dt} \left( t^3 e^t \right) \)

\[
= t^3 e^t + 3t^2 e^t
\]

(c) \( \frac{d^2}{dx^2} (4x^5 - 5x^3 + x) \)

\[
= \frac{d}{dx} \left( 20x^4 - 15x^2 + 1 \right)
\]

\[
= 80x^3 - 30x
\]