1. Find the slope-intercept form for the tangent line to the graph of
   \[ f(x) = \frac{x^3 + 12}{3x - 4} \] at \((2, f(2))\).

2. Find the derivatives of the following functions. (Do not simplify your answers.)
   a) \[ f(x) = \left[ \frac{6}{x} + x^3 (x^5 + 1)^2 \right]^4 \]
   b) \[ f(x) = \frac{\sqrt[6]{3x \sin^q 5x}}{(x^2 + 1)^6} \]

3. Find \( \frac{dy}{dx} \) for the curve \( y^5 + 4x^2y^4 - 6y = x^3 + \tan 8y \).

4. If \( D_x (\arctan x) = \frac{1}{x^2 + 1} \), show how to use the chain rule to find \( h'(x) \) if \( h(x) = \arctan (\sec \frac{x}{4}) \).

5. Find the x-coordinates of the points on the graph of
   \[ f(x) = \frac{x^4 + 45}{x^2 + 2} \] at which the tangent line is horizontal.

6. Find \((g \circ h)'(4)\) if \( g(4) = -2, \ g'(4) = 9, \ g'(3) = 7, \ g'(-2) = 6\)
   \( h(4) = 3, \ h'(4) = 5, \ h'(3) = 11, \ h'(-2) = -8. \)

7. If \( f(x) = \frac{4x}{(x^2 + 75)^4} \), find and simplify \( f'(x) \).

8. If the volume of a cube is increasing at a rate of 30 cm³/sec, how fast is the surface area of the cube increasing when its volume is 125 cm³?

9. Find \( \lim_{h \to 0} \frac{\cos^3 \left( \frac{\pi}{3} + h \right) - \frac{1}{8}}{h} \) (by interpreting this limit as a derivative).

10. At 8 am, Sam is 240 miles due west of Kim. If Sam drives east at the rate of 50 mph and Kim drives south at the rate of 40 mph, how fast is the distance between them changing at 11 am?

11. Find an equation of the line which is tangent to the curve \( y = \sqrt{x} \) which passes through the point \((0, 5, 1)\).