1. Factor the expression \(10x^2 + xy - 2y^2\).

2. If \(f(x) = (64x^6)^{1/3}\), what is \(f(-3)\)?

3. Simplify the function \(f(x) = \sqrt{32(x + 3)} - \sqrt{18(x + 3)}\).

4. Some calculus problems will require you to find where two functions are equal. For what values of \(x\) are the following functions equal:
   a. \(f(x) = \frac{2}{x} + \frac{4}{3}\) and \(g(x) = \frac{12}{x}\)
   b. \(F(x) = x^2 - 4\) and \(G(x) = 4x^2 + 11x + 6\)
5. If
\[ f(x) = \frac{9x^2 - 4}{3x} \quad \text{and} \quad g(x) = \frac{3x + 2}{4x^2} \]
write \( h(x) = \frac{f(x)}{g(x)} \) in simplified form. For which values of \( x \) is the quotient defined (before simplification)?

6. If \( f(x) = \sqrt{1 - x^2} \) and \( g(x) = \sin(3x) \). Write the compositions \( f(g(x)) \) and \( g(f(x)) \) and state their domains.

7. Write the function \( f(x) = \left( \frac{x^3 + 2x + 1}{3x^2 + 1} \right)^{3/2} \) as the composition of two functions.