Vocabulary/Definitions

- \( \int_{3}^{1} f(x) \, dx = \)
- \( \int_{1}^{4} f(x) \, dx + \int_{4}^{8} f(x) \, dx = \)
- \( \int_{a}^{b} f(x) + g(x) \, dx = \)
- \( \int_{a}^{b} cf(x) \, dx = \)
- If \( M \) bounds \( f \) from above, then... 
- If \( m \) bounds \( f \) from below, then... 
- How can \( M \) and \( m \) be used to give limits on the size of integrals?

Understand

1. If \( \int_{a}^{b} f(x) \, dx = 3 \) and \( \int_{a}^{b} g(x) \, dx = 7 \), find \( \int_{3}^{1} 3f(x) - g(x) \, dx \).

2. Use the Fundamental Theorem of Calculus to find \( \int_{1}^{4} 3x^2 \, dx \).

3. Find an upper and lower bound for \( f(x) = x^2 \) on the interval \( 1 \leq x \leq 3 \). Give upper and lower bounds for \( \int_{1}^{3} x^2 \, dx \).