Fraction and Decimal Substitution with Powers and Roots: Exercise

1. Find the value of the following expressions when \( a = -0.5 \):
   - a. \( a^2 \)
   - b. \( 2a^2 \)
   - c. \( 2a^2 + 5 \)
   - d. \( (2a)^2 + 5 \)
   - e. \( 3a^2 + 2a \)
   - f. \( a^3 + 2a^2 \)
   - g. \( (4a)^5 - 2a^2 \)
   - h. \( \frac{8a^6}{4a^2} \)

2. Given that \( x = \frac{2}{5} \) and \( y = -\frac{2}{3} \), find the value of \( 25x^2 - 27y^3 \).

3. You are told that \( p = -0.5 \), \( q = \frac{1}{8} \) and \( r = 0.16 \). Find the value of the following expressions.

   Question a-e are non-calculator. Use a calculator for questions f-h and give your answers to 2 decimals places.
   - a. \( \sqrt{r} \)
   - b. \( \sqrt[3]{q} \)
   - c. \( \sqrt[3]{pr} \)
   - d. \( \sqrt{p^2 - r} \)
   - e. \( 5\sqrt{r} \)
   - f. \( \sqrt{qr} + p \)
   - g. \( 3\sqrt{qr} + p \)
   - h. \( \sqrt[5]{10r - \frac{q}{p}} \)

4. This formula can be used to calculate the displacement (\( s \) metres) of an object given its initial velocity (\( u \) m/s), time spent moving (\( t \) seconds) and acceleration (\( a \) m/s\(^2\)):
   \[
   s = ut + \frac{1}{2}at^2
   \]

   Find the value of \( s \), given that \( a = \frac{1}{50} \), \( u = 5.5 \) and \( t = 2.5 \).