1. Rationalize the denominator. Write answer in lowest terms.
   \[
   \frac{6}{2 + \sqrt{14}}
   \]

2. Evaluate \( \sqrt[3]{108}x^7y^{12}z^{17} \)

3. Evaluate each expression.
   (a) \(-7^2 = \)
   (b) \((-3)^{-2} = \)
   (c) \(\left( \frac{64}{27} \right)^{-2/3} = \)

4. Perform the indicated operations and simplify.
   (a) \((3x - 4)^2\)
   (b) \(3\sqrt{28} - 8\sqrt{63} + 2\sqrt{175}\)
   (c) \((5x - 4)(4x^2 - 7x - 2)\)

5. Factor the following expressions completely.
   (a) \(27x^3 - 45x^2 - 3x + 5\)
   (b) \(24x^{3/2} + 16x^{1/2} - 30x^{-1/2}\)
   (c) \(2x^3(4)(5x - 3)^3(5) + 6x^2(5x - 3)^4\)

6. Simplify each of the following expressions and eliminate any negative exponent(s).
   (a) \(\left( \frac{-3x^2y^{-4}z^3}{4x^{-6}y^{-2}z^6} \right)^{-2}\)
   (b) \(\frac{(2x^{-4}y^2)^{-3}(x^2y^{-4}z)^2}{4xy^{-3}z^2}\)
   (c) \(\left( \frac{2}{3x^2y^{-3}z^4} \right)^{-2} (2x^4yz^3)^3\)

7. Simplify the following expressions
   (a) \(\frac{6x^2 + 11x - 10}{18x^2 + 37x - 20} \cdot \frac{8x^2 - 22x + 9}{6x^2 - 7x + 2}\)
   (b) \(\frac{x + 2}{x - 2} - 3\)
   (c) \(\frac{3(1 + x)^{1/3} - x(1 + x)^{-2/3}}{(1 + x)^{2/3}}\)

8. Solve for \(x\).
   (a) \(5x - 3 [2 + 4 (5 - 2x)] = 6x - 3\)
   (b) \(2 (x + 5)^4 - 96 = 0\)
   (c) \(\frac{x}{x + 2} - 3 = \frac{5}{3x + 6}\)
1. \[-\frac{3(2 - \sqrt{14})}{5}\]

2. \[3x^2y^4z^5\sqrt[3]{4xz^2}\]

3. (a) \(-49\)
   
   (b) \(\frac{1}{9}\)

   (c) \(\frac{9}{16}\)

4. (a) \(9x^2 - 24x + 16\)

   (b) \(-8\sqrt{7}\)

   (c) \(20x^3 - 51x^2 + 18x + 8\)

5. (a) \((3x - 5)(3x - 1)(3x + 1)\)

   (b) \(2x^{-1/2}(6x - 5)(2x + 3)\)

   (c) \(2x^2(5x - 3)^3(35x - 9)\)

6. (a) \(\frac{16y^4z^6}{9x^{16}}\)

   (b) \(\frac{x^{15}}{32y^{11}}\)

   (c) \(18x^8y^9z\)

7. (a) \(\frac{4x - 9}{9x - 4}\)

   (b) \(\frac{-2}{x - 2}\)

   (c) \(\frac{3 + 2x}{(1 + x)^{4/3}}\)

8. (a) \(x = \frac{63}{23}\)

   (b) \(x = -5 \pm 2\sqrt{3}\)

   (c) \(x = -\frac{23}{6}\)