1) Simplify without using a calculator:
   a) \((37 \times 0.256 - 771 \times 0.023 + 63 \times 0.256 - 229 \times 0.023) ÷ 1.3\)
   b) \(\frac{(4 + \sqrt{3})^3 - \sqrt{5} \cdot (4 - \sqrt{3})^3}{13^{2 - \sqrt{5}}}\)
   c) \((0.25)^{0.25}\)

2) Each set of numbers on the left can be described as being an example of a kind of number on the right. Match each set on the left the kind of the number that best describes its members on the right.
   \[
   \begin{align*}
   \{\sqrt{2}, \pi, \sqrt{\pi}\} & \quad \text{Real} \\
   \{\sqrt{36}, \sqrt{36}, 6\} & \quad \text{Rational} \\
   \{77, -24, \sqrt{5}\} & \quad \text{Irrational} \\
   \{-3, 4, 0\} & \quad \text{Integer} \\
   \{1, 2, 3\} & \quad \text{Natural}\end{align*}
   \]

3) Write without absolute value bars and simplify:
   a) \(|\pi - 7| - |4 - \pi|\)
   b) \(\frac{|10\pi - 32|}{5\pi - 16}\)
   c) If \(x < \frac{1}{2}\), \(\frac{|2x - 1|}{1 - 2x} = \_\_\_\_\_.\)

4) Find the products:
   a) \((2x + 3y - 1)(2x - 3y - 1)\)
   b) \((2x + 3y)(2x - 3y)(4x^2 + 9y^2)\)

5) Factor completely. Leave the expression rationalized and with only positive exponents:
   a) \(8x^3 - 27x^6\)
   b) \(7(3x^2 + 2)^2(1 - x^2)^2 + (3x^2 + 2)(1 - x^2)^3\)
   c) \(-x^{-1}(1 + x^2)^2 - 2x^{-3}(1 + x^2)^3\)
   d) \(2x^3 - 8x - 5x^2 + 20\)

6) Simplify the rational expressions. State the domain of the expression:
   a) \(\frac{x^3 - 8}{x^2 - 4} \div \frac{x^3 + 2x^2 + 4x}{x^2 + x - 2}\)
   b) \(\frac{x^{-1} + y^{-1}}{x - y} + \frac{y^{-1}}{y - x}\)
   c) \(\frac{(x + 1)^2(2x) - x^2(2)(x + 1)}{(x + 1)^{3/2}}\)
7) Simplify:
   a) \[ \frac{4 - 2\sqrt{3} + 3}{2 - \sqrt{3}} \]
   b) \[ \sqrt{\frac{8 + 1}{\sqrt{2}}} \]

8) Solve and check the solutions:
   \[ 2\sqrt{x} + 1 - \sqrt{2}x + 3 = 1 \]

9) Solve for \( y \) in ...
   \[ \frac{3}{y - 2} + \frac{1}{y + 1} = \frac{1}{y^2 - y - 2} \]

10) Solve the inequality:
    \[ -2|x - 5| + 15 < -5 \]

11) What is the domain of the expression:
    \[ \sqrt{3} - |4 - 2x| \]

12) Find all the values of \( k \) so that \( 2x^2 + 4x + k = -1 \) has two distinct solutions.

13) Which of the following are true?
    a) \(-22.345 < -22.345\)
    b) \((2x)^{-1} = \frac{2}{x}\)
    c) \(\sqrt[5]{(-2)^4} = 2\)
    d) \(\frac{2}{\sqrt[5]{(-2)^5}} = -2\)

14) Consider the function,
    \[ f(x) = \begin{cases} 
    |x| & \text{if } -2 \leq x < 0 \\
    1 & \text{if } x = 0 \\
    2x^2 & \text{if } x > 0 
    \end{cases} \]
    a) Find the domain of the function.
    b) Evaluate \( f(-1) \) and \( f(1) \).
    c) Graph the function.

15) Consider the points \((1,3)\) and \((7,11)\)
    a) Find the distance between the points.
    b) Find the midpoint of the line segment connecting these two points.
    c) If the points above are the endpoints of the diameter of a circle, write the equation of this circle.
    d) Write the equation of the line, in general form, through the two points given above.
    e) Graph the line and this circle.

16) Find the center and radius of the circle given by
    \[ \frac{1}{4}x^2 + \frac{1}{4}y^2 - \frac{3}{2}x - \frac{5}{2}y = -\frac{15}{2} \]

17) Find \( k \) so that the line passing through the points \((-7,4)\) and \((k, 6)\) is perpendicular to the line \(2x + 4y = 3\).