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1) 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.

$\{\sqrt{2}, \pi, \sqrt[9]{\pi}\}$	Real
$\{1,2,3\}$	Whole
$\{77, -24, \sqrt[3]{5}\}$	Natural
$\{-3,4,0\}$	Irrational
$\{0,1,2\}$	Integer

2) Write without absolute value bars and simplify:

$$|\pi - 7| - |4 - \pi|$$

3) Factor completely. Leave the expression with only positive exponents:
   a) $x^2 + 5x - 36$
   b) $7(3x^2 + 2)^2(1 - x^2)^2 + (3x^2 + 2)(1 - x^2)^3$
   c) $-x^{-1}(1 + x^2)^{-\frac{1}{2}} - 2x^{-3}(1 + x^2)^{\frac{1}{2}}$

4) Simplify the rational expressions. State the domain of the expression:
   a) $\dfrac{x^3 - 8}{x^2 - 4} \div \dfrac{x^2 + 2x + 4}{x^2 + x - 2}$
   b) $\dfrac{x^{-1}}{x - y} + \dfrac{y^{-1}}{y - x}$

5) Simplify and leave the expressions with only positive exponents:
   a) $\left(\dfrac{x^2 y}{4z^{-1}}\right)(8x^{-2}yz^3)$
   b) $\sqrt[3]{\dfrac{16x^2y^{-6}z^{10}}{y^{-5}z^{-2}}}$
   c) $\sqrt[3]{\sqrt{64}}$
   d) $\sqrt{\sqrt[3]{320a^7b}}$

6) Solve and check the solutions:

$$2\sqrt{x + 1} - \sqrt{2x + 3} = 1$$

7) Solve for the indicated variable:
   a) Solve for R in …

$$\frac{1}{R} - \frac{1}{r_1} = \frac{1}{r_2}$$

   b) Solve for y in …

$$\frac{3}{y - 2} + \frac{1}{y + 1} = \frac{1}{y^2 - y - 2}$$

8) Solve the inequality:

$$-2|x-5|+15<-5$$

9) Simplify Completely:

$$\frac{(x+1)^2(2x)-x^2(2)(x+1)}{(x+1)^4}$$

10) Factor Completely:

$$8z^3-27z^6$$

11) Solve the following quadratic equations using the specified method:
   a) $5x^2-2x=3$, by using the zero factor principal.
   b) $9x^2-12x-14=0$, by completing the square.
   c) $5x^2-2x=-1$, by the quadratic formula.

12) Solve the equations by making an appropriate substitution and/or factoring. Check your answers:
   a) $x^6-13x^4+36x^2=0$
   b) $\sqrt{x}+3\sqrt[4]{x}-18=0$
   c) $3x^{\frac{1}{2}}+13x^{-\frac{1}{2}}=10x^{-\frac{3}{2}}$

13) Consider the following equation $-4x+3y=24$
   a) Find the intercepts.
   b) Find the distance between the intercepts.
   c) Find the midpoint of the line segment connecting the two intercepts.
   d) Is the midpoint a solution to the equation?
   e) Sketch a graph of the equation.

14) What symmetries do the graphs following equations have
   a) $y^2-2=3x$
   b) $x-2y=0$
   c) $y+|x|=0$
   d) $x^2+y^2=9$

15) Consider the list of mathematical expressions below. All of them display a very typical algebra error. Explain what the error is and write the correct expression.

   a) $(2+x)^2\neq 4+x^2$
   b) $\left(\frac{x}{3}\right)\left(\frac{y}{3}\right)\neq\frac{1}{3}(xy)$
   c) $(5y-10)\neq 5(y-2)^2$
   d) $\frac{1}{2}+\frac{1}{3}\neq\frac{1}{6}$
   e) $\frac{1}{5x}\neq\frac{1}{5}x$
   f) $2y^4\neq(2y)^4$
   g) $\frac{1}{y^4+y^2}\neq y^{-4}+y^{-2}$
   h) $\sqrt[2]{7x}\neq 7\sqrt[3]{x}$
   i) $\sqrt[3]{x^3+27}\neq x+3$
   j) $\frac{4+3x}{4}\neq 1+3x$
   k) $\frac{4+4x}{4}\neq 4+x$