1. If $x < 0$ and $y > 0$, determine the sign of the real numbers below.
   (a) $\frac{x}{y}$
   (b) $\frac{x-y}{xy}$
   (c) $xy^2$

2. Express the following statements as inequalities.
   (a) $b$ is positive
   (b) $a$ is non-positive
   (c) $x$ is greater than or equal to $-4$
   (d) $n$ is not greater than 2
   (e) the reciprocal of $m$ is at most 14

3. Simplify
   (a) $| -5 + 1 |$
   (b) $|7| - | -1 |$
   (c) $| \frac{1}{4} - \frac{1}{3} |$

4. Find the distance between the two points on a number line
   (a) $-6$ and $-2$
   (b) $-5$ and 4
   (c) $x$ and 2

5. Rewrite the expression without using the absolute value symbol and simplify
   (a) $| 5 - x |$ if $x > 5$
   (b) $| a - b |$ if $a \leq b$

6. Simplify completely
   (a) $(-2u^2w^{-5})^3(7u^4w^6)$
   (b) $\left( \frac{3x^{-1}y^8}{2x^7y^2} \right)^{-4}$
   (c) $-3^2 + (-3)^2 + 3^{-2}$

7. Rewrite the expression using exponents
8. Rewrite the expression using radicals (and simplify)
   (a) $3 + y^{5/3}$
   (b) $\left(\frac{s^{1/2}t^{2/5}}{s^{3/3}t^{-3}}\right)^{1/3}$

9. Simplify
   (a) $\sqrt[3]{\frac{x^0y^4}{3z^3}} \cdot \sqrt[3]{81x^9y^{-10}z^6}$
   (b) $3\sqrt{40} + \sqrt{250}$
   (c) $\sqrt[3]{x}$
   (d) $3^{-1} \cdot (2^{1/2} + 2^{3/2})^2$
   (e) $\frac{16^{3/2} + 9^{-4/3}}{16^{3/2} - 9^{-4/3}}$

10. Simplify. Assume $x$ may be negative and $a > 0$.
    (a) $\sqrt{100x^4}$
    (b) $\sqrt[3]{\frac{x^3}{27}}$
    (c) $\sqrt[4]{a^4/a^3}$

11. Rationalize the denominator
    (a) $\frac{5}{3\sqrt{2}}$
    (b) $\frac{4}{3 - \sqrt{5}}$

12. Solve:
    (a) $-2x + 9 - 5x = 3(x - 4) - 5$
    (b) $3(2x + 5) - (3 + 6x) = 10$
    (c) $-\frac{2}{3}x + \frac{1}{2} \leq \frac{5}{6}$
    (d) $3 - \left|\frac{2x + 5}{3}\right| = 5$
    (e) $-3 - |2x + 5| \geq -11$

13. **Challenge:** A thin piece of copper wire 20 inches in length is to be cut into two parts. From one part, a square will be made; from the other, a circle. Let $x =$ the length of the side of the square. What is the sum of the areas of the two figures in terms of $x$?