

Name _____

Group Members:

- If $x < 0$ and $y > 0$, determine the sign of the real numbers below.
 - $\frac{x}{y}$
 - $\frac{x-y}{xy}$
 - xy^2
- Express the following statements as inequalities.
 - b is positive
 - a is non-positive
 - x is greater than or equal to -4
 - n is not greater than 2
 - the reciprocal of m is at most 14
- Simplify
 - $|-5 + 1|$
 - $|7| - |-1|$
 - $|\frac{1}{4} - \frac{1}{3}|$
- Find the distance between the two points on a number line
 - -6 and -2
 - -5 and 4
 - x and 2
- Rewrite the expression without using the absolute value symbol and simplify
 - $|5 - x|$ if $x > 5$
 - $|a - b|$ if $a \leq b$
- Simplify completely
 - $(-2u^2w^{-5})^3(7u^4w^6)$
 - $(\frac{3x^{-1}y^8}{2x^7y^5})^{-4}$
 - $-3^2 + (-3)^2 + 3^{-2}$
- Rewrite the expression using exponents

- (a) $\sqrt[3]{5^2}$
- (b) $\sqrt{a+b}$

8. Rewrite the expression using radicals (and simplify)

- (a) $3 + y^{5/3}$
- (b) $\left(\frac{s^{1/2}t^{2/5}}{s^{1/3}t^{-3}}\right)^{1/3}$

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) $\sqrt[3]{\sqrt[5]{x}}$
- (d) $3^{-1} \cdot (2^{\frac{1}{2}} + 2^{\frac{3}{2}})^2$
- (e) $\frac{16^{\frac{3}{4}} + 9^{-\frac{1}{2}}}{16^{\frac{3}{4}} - 9^{-\frac{1}{2}}}$

10. Simplify. Assume x may be negative and $a > 0$.

- (a) $\sqrt{100x^4}$
- (b) $\sqrt[3]{\frac{x^3}{27}}$
- (c) $\sqrt[4]{a}\sqrt[4]{a^3}$

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 ?