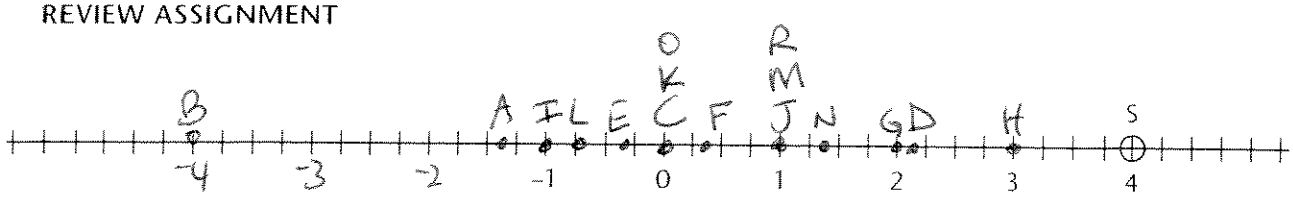
# Review Assignment

1. Evaluate/simplify these expressions and place the letter corresponding to each one on the number line below. (*Place a dot on the number line and the letter above it, as shown in the example.*) If the number does not simplify to some defined value, i.e., it is undefined, then just state that and you will not be able to plot that on the number line. Also fill in the table telling the smallest set the number belongs to. Choose from these number sets: **R** = real numbers, **Q** = rational numbers, **I** = irrational numbers, **Z** = integers, **W** = whole numbers.

W → Z → Q ⊃ R

| NUMBER TO EVALUTE AND PLOT: | SET: |
|---|---|
| A. $-\sqrt{2}$ | I |
| B. $-2^2$ $= -4$ | Z |
| C. $5^0$ $=0$ | W |
| D. $\pi - 1$ | I |
| E. $-0.3$ | Q |
| F. $0.\overline{3}$ $= 1/3$ | Q |
| G. $\sqrt{7-3}$ $= \sqrt{4} = 2$ | W |
| H. $\lvert 3-6 \rvert$ $= 3$ | W |
| I. $\frac{\lvert x \rvert}{x}$ if $x$ is negative if x neg. $\lvert x \rvert = -x \Rightarrow \frac{\lvert x \rvert}{x} = \frac{-x}{x} = -1$ | Z |
| J. $\frac{\lvert x \rvert}{x}$ if $x$ is postive if x pos. $\lvert x \rvert = x, \Rightarrow \frac{\lvert x \rvert}{x} = 1$ | W |
| K. Additive Identity $=0$ | W |
| L. Additive Inverse of $\frac{3}{4}$ $= \frac{-3}{4}$ | Q |
| M. Multiplicative Identity $=1$ | W |
| N. Multiplicative Inverse of $\frac{3}{4}$ $= 4/3$ | Q |
| O. $\frac{0}{4}$ $=0$ | W |
| P. $\frac{4}{0}$ undefined | in no set |
| Q. $\frac{0}{0}$ undefined | in no set |
| R. $0.\overline{9}$ $=1$ | W |
| EXAMPLE: S. $\frac{8}{2} = 4$ | W |




2. List all the integers in these intervals.

(a) $(-3, 4]$ $-2, -1, 0, 1, 2, 3, 4$

(b) $[1, 5]$ $1, 2, 3, 4, 5$

(c) $(5, \infty)$ $6, 7, 8, \ldots$

(d) $(3, 4)$ none

(e) $(-\infty, 1]$ $\ldots, -3, -2, -1, 0, 1$

3. Using $5x^3 - 2x + 4 = 0$, fill in an example of each of these questions to practice your understanding of the vocabulary words. (For instance, if I asked for "degree," you'd say 3 is the degree.)

| VOCABULARY WORD | EXAMPLE |
|---|---|
| Equation | $5x^3 - 2x + 4 = 0$ |
| Expression | $5x^3 - 2x + 4$ or $5x^3$, etc. |
| Term | $5x^3$ or $-2x$ or $4$ or $0$ |
| Factor | $5$ or $x^3$ or $-2$ or $x$ |
| Constant | $4$ |
| Coefficient | $5$ or $-2$ |
| Exponent | $3$ or $1$ |

4. Use the order of operations to evaluate these expressions.

(a) $3 \cdot 5 - 6 \div 4 + 2 \cdot$ $= 15 - \frac{3}{2} + 2 = 17 - \frac{3}{2} = 15\frac{1}{2}$

(b) $4 + 3 \cdot 2^3 \div 4 - 2$ $= 4 + 3 \cdot 8 \div 4 - 2 = 4 + 24 \div 4 - 2 = 4 + 6 - 2 = 8$

(c) $\frac{2x^3 - x}{yx + y}$ if $x = -2, y = 3, z = -6$ $\frac{2(-2)^3 - (-2)}{3(-2) + 3} = \frac{2(-8) + 2}{-6 + 3} = \frac{-16 + 2}{-3} = \frac{-14}{-3} = \frac{14}{3}$

5. Evaluate these power (exponent) expressions.

(a) $64^{\frac{2}{3}} = (4^3)^{2/3} = 4^2 = 16$

(b) $64^{\frac{3}{2}} = (8^2)^{3/2} = 8^3 = 512$

(c) $64^{\frac{-2}{3}} = \frac{1}{16}$

(d) $64^{\frac{-3}{2}} = \frac{1}{512}$

(e) $-64^{\frac{3}{2}} = -512$

(f) $(-64)^{\frac{2}{3}} = -16$

6. Simplify, by rationalizing the denominator.

(a) $\frac{5}{\sqrt{10}}\left(\frac{\sqrt{10}}{\sqrt{10}}\right) = \frac{5\sqrt{10}}{10} = \frac{\sqrt{10}}{2}$

(b) $\frac{3}{(\sqrt{5}-2)}\left(\frac{\sqrt{5}+2}{\sqrt{5}+2}\right) = \frac{3\sqrt{5}+6}{5+2\sqrt{5}-2\sqrt{5}-4} = \frac{3\sqrt{5}+6}{5-4} = 3\sqrt{5}+6$

(c) $\frac{\sqrt{2x^3}}{\sqrt{8x^6}}\left(\frac{\sqrt{2}}{\sqrt{2}}\right) = \frac{2|x|\sqrt{x}}{4|x|^3} = \frac{\sqrt{x}}{2x^2}$

7. Simplify and write each expression with positive, rational exponents.

(a) $\frac{5^{-\frac{1}{2}}\left(5x^{\frac{3}{2}}\right)}{(5x)^{\frac{1}{2}}} = \frac{5^{-1/2}5^{1}x^{5/2}}{5^{1/2}x^{1/2}} = 5^{-1}x = \frac{x}{5}$

(b) $\sqrt[3]{\sqrt{8x^4y^6}} =$

(c) $\frac{32 \cdot 8 \cdot 2^4}{64 \cdot 16 \cdot 2^{-3}}$ (*Hint:* Rewrite this as 2 to some power.)

$2 \quad 2$

$= \frac{2^4 2^3}{4} = 2^2 \cdot 2^3 = 2^5 = 32$