

INTERMEDIATE ALGEBRA

GPS #2

1.2 Operations on Real Numbers

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Some Useful Guidelines:

* Absolute Value $|a| = \begin{cases} a, a \geq 0 \\ -a, a < 0 \end{cases}$

* Additive Inverse: The additive inverse (or opposite) of a real number a is $-a$.

* Multiplicative Inverse: The multiplicative inverse (or reciprocal) of a real number a is $\frac{1}{a}$.

* Division: $\frac{a}{b} = a \cdot \frac{1}{b}$

Note: a, b, c are real numbers.

Evaluate the following:

1. a) $|-8| + 3$
 $8 + 3$
 $= 11$

b) $|-3| + |-2| + 1$
 $3 + 2 + 1$
 $= 6$

c) $|5| + |-7| + 2$
 $5 + 7 + 2$
 $= 14$

2. a) $|6 - 8 + 1|$
 $= |-2 + 1|$
 $= |-1|$
 $= 1$

b) $|4.5 - 5 + 1|$
 $\rightarrow |-0.5 + 1|$
 $\rightarrow |0.5|$
 $= 0.5$

c) $|-2 + 3.2 - 5|$
 $= |-3.8|$
 $= +3.8$

3. Find the additive inverse, or opposite, of the following:

a) 347
 -347

b) $-\frac{5}{6}$
 $\frac{5}{6}$

c) $2 - 3x$
 $-2 + 3x$

c) $-a + b$
 $a - b$

4. Find the multiplicative inverse, or reciprocal, of the following:

a) $\frac{8}{9}$
 $\frac{9}{8}$

b) $-\frac{3}{4}$
 $-\frac{4}{3}$

c) $\frac{3}{x-1}$
 $\frac{x-1}{3}$

d) $4a$
 $\frac{1}{4a}$

5. Evaluate the following arithmetic operations and simplify.

a) $-2 + 1 + (-3) + 6$
 $= 2$

b) $\frac{-3}{2} - \left(\frac{-1}{2}\right)$
 $= \frac{-3 - (-1)}{2} = \frac{-3 + 1}{2} = \frac{-2}{2} = -1$

d) $\left(\frac{4}{3} \cdot \frac{3}{8}\right) \div \frac{1}{2}$
 $= \left(\frac{1}{2}\right) \div \frac{1}{2} = \frac{1}{2} \times \frac{2}{1} = 1$

c) $-9 \div -3$
 $= -9 \times -\frac{1}{3} = \frac{9}{3} = 3$

e) $7x - 2x + x$
 $= x(7 - 2 + 1)$
 $= 6x$

f) $\frac{1}{2}x - \frac{1}{4}x$
 $= x\left(\frac{1}{2} - \frac{1}{4}\right)$
 $= x\left(\frac{2-1}{4}\right)$
 $= x\left(\frac{1}{4}\right) = \frac{x}{4}$