TH-A2 Algebra 2 Week 2

1-1 Properties of Real Numbers

Opposite — sign change

$4 \rightarrow -4$

$-8 \rightarrow 8$

Inverse (reciprocal) — "flip"

$\frac{3}{4} \xrightarrow[\text{reciprocal}]{\text{inverse}} \frac{4}{3}$

$\frac{9}{1} \rightarrow \frac{1}{9}$

both opposite & reciprocal: $3 \rightarrow -\frac{1}{3}$

	opposite	reciprocal
1.) $3 \rightarrow -3$		$\frac{1}{3}$
3.) $-\frac{1}{6} \rightarrow \frac{1}{6}$		-6
5.) $-5\frac{2}{3} \rightarrow \frac{17}{3}$	$5\frac{2}{3}$	$-\frac{3}{17}$
7.) $x+6$	$-x-6$	$\frac{1}{x+6}$

mixed number → improper fraction: $\frac{(5*3)+2}{3} = \frac{17}{3}$

$6 \rightarrow \frac{3}{17}$

$-\frac{1}{x+6}$ or $\frac{1}{-x-6}$

Absolute Value

Distance from the number to zero on the number line.

$|-8| = 8$ $\quad$ $|7| = 7$

$$|10-19| = |(10-19)| = |-9| = 9$$

$$|5| - |-8|$$
$$\downarrow \quad \downarrow$$
$$5 - 8 = -3$$

$$-8|7| = -8(7) = -56$$

Rational number → any number that can be put into a fraction.

Irrational numbers → numbers that cannot be put into a fraction.

Rational Numbers

Counting Number → 1, 2, 3, 4, 5...

whole numbers → 0, 1, 2, 3, 4, 5...

integer → ...-3, -2, -1, 0, 1, 2, 3, 4...
all whole numbers and their opposites

Terminal Decimal
rational

$0.35 = \frac{35}{100} = \frac{7}{20}$

Repeating decimal
rational

single repeat

$0.4444\ldots = \frac{4}{9}$

$0.\overline{4}$

group repeat

$0.\overline{142857}\ 142857\ldots = \frac{1}{7}$

Non-repeating decimal
irrational

$0.713482\ldots$

Perfect Squares
rational

$\sqrt{9}, \sqrt{16}, \sqrt{25}, \sqrt{36}$

Non-perfect Square → irrational

$\sqrt{90}, \sqrt{150}$

Properties

Commutative Property
(Add + Mult)

$17 + 89 + 83 = 189$

$17 + 83 + 89 = 189$

100

change order

$4 * 17 * 25 = 1700$

$4 * 25 * 17$

$100 * 17$

Associative Property
(Add + Mult)
change parenthesis

$36 + (64 + 23) =$

$(36 + 64) + 23$

$a * (b * c) = (a * b) * c$

Identity Property

$4 + 0 = 4 \quad a + 0 = a$

$a + 3 = 8$
$-3 \quad -3$

$a + 3 - 3 = 5$

$a + 0 = 5$

$a = 5$

$9 * 1 = 9$

$b * 1 = b$

Inverse Property add opposite = 0

$8 + (-8) = 0$

mult by inverse = 1

$8 * \frac{1}{8} = 1$

Distributive

$3(a + 2) = \boxed{3a + 6}$

1-2 Algebraic Expressions [Substitution]

$(4x+1)+2x \qquad x=3$

$(4(3)+1)+2(3)$

$(12+1)+6 \qquad 13+6=19$

3.) $3y+4z+6y-9z \qquad y=2 \quad z=1$

$9y-5z \qquad 9(2)-5(1)$

$18-5=13$

5.) $5a^2+5a+a+1 \qquad a=-2$

$5a^2+6a+1 \qquad 5(-2)^2+6(-2)+1$

$5(4)+6(-2)+1$

$20-12+1 \qquad 8+1=9$

21.) $-m*(2m+m^2) \qquad m=-4$

$-m*(2m+m^2)$

$-(-4)*(2(-4)+(-4)^2)$

$4(-8+16) = 4(8) = 32$

HW
1-1 evens
1-2 evens