T-A2 Algebra 2 Week 2

"opposite" ⟶ sign change

opposite of $3 \to -3$

opposite of $-8 \to 8$

"reciprocal" (inverse)

reciprocal of $\frac{3}{4} \to \frac{4}{3}$

reciprocal of $\frac{7}{1} \to \frac{1}{7}$

reciprocal of $\frac{1}{3} \to \frac{3}{1} = 3$

reciprocal of $\cancel{0} \to$ undefined

$\frac{0}{1} \to \frac{1}{0}$

opposite reciprocal

$\frac{8}{9} \xrightarrow{\text{opposite}} -\frac{8}{9} \xrightarrow{\text{reciprocal}} -\frac{9}{8}$

opposite reciprocal

1.) $\frac{3}{5} \to \frac{-3}{5} \to \boxed{-\frac{5}{3}}$

2.) $-2.4 \to 2.4 \to \boxed{\frac{1}{2.4}}$

$-2.4 = \frac{-12}{5} \to \boxed{\frac{5}{12}}$

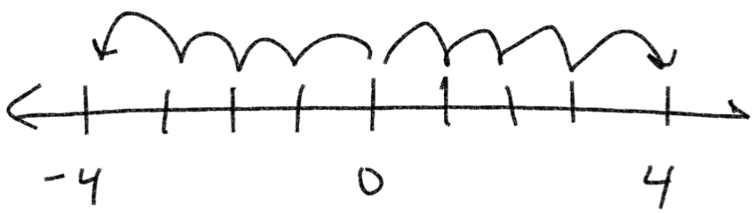
3.) $2\frac{1}{4} = \frac{(2*4)+1}{4} = \frac{9}{4} \to \boxed{-\frac{4}{9}}$

4.) $\pi + 2 \to \frac{-\pi - 2}{1} = \boxed{\frac{1}{-\pi-2}}$

$-(\pi+2)$

Absolute value $|4| = 4$ $|-4| = 4$

Distance from the number to 0 on a number line



$|-3| = 3$

$-|7| = -7$

$|(4-12)| = |-8| = \boxed{8}$

$|5| - |-6| = -1$

$5 - 6 = -1$

Real numbers

Imaginary Numbers

rational

irrational

ratio → fraction

rational number → can be put into a fraction

irrational number → cannot be put into a fraction.

Rational Numbers

Counting numbers 1, 2, 3, 4 . . . .

whole numbers 0, 1, 2, 3, 4 . . . . .

all counting plus 0

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

Rational Numbers → Decimals

0.45 → terminal decimal

rational → fraction

$\frac{0.45}{1.00} = \frac{45}{100} = \frac{9}{20}$

$0.687 = \frac{687}{1000}$

0.4444.... single repeat

repeating decimal

$0.444... = 0.\overline{4} = \frac{4}{9}$

$0.\underline{234}\,\underline{234}\,\underline{234}...$ repeating decimal $= \frac{234}{999}$

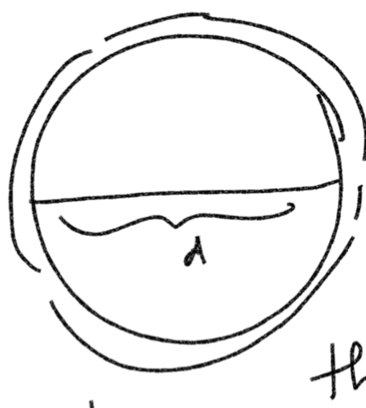
$0.12444... = 0.12\overline{4}$ ⇒ rational

0.1234567.... irrational

$\pi = 3.1415...$

$C = \pi d$

$\pi = \frac{C}{d}$

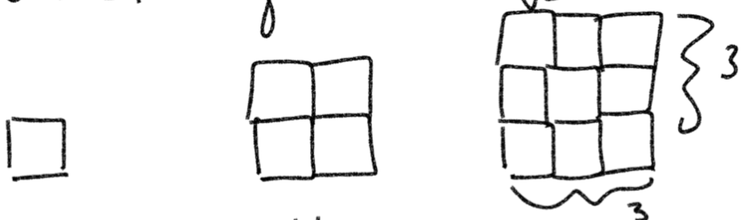


π is the number of times the diameter wraps around the circumference of a circle

π is irrational number ?

Rational Numbers

Perfect Square $\sqrt{36} = \pm 6$



1 4 9

Perfect square

	0	$\sqrt{0} = 0$
1	1	$\sqrt{1} = 1$
3	4	$\sqrt{4} = 2$
5	9	$\sqrt{9} = 3$
7	16	$\sqrt{16} = 4$
9	25	$\sqrt{25} = 5$
11	36	

$\sqrt{40}$ not perfect square
irrational

Rational / Irrational — Type of Number

1.) 4 Rational, counting, whole, integer

2.) −7 Rational integer

3.) 0.8888... Rational, repeating decimal

4.) 0.143143 Rational, terminal

5.) 0.347348... Irrational

6.) 0.428482 rational, terminal

7.) $\sqrt{81}$ rational, perfect square

8.) $\sqrt{200}$ irrational

9.) π irrational

Commutative Property

$8+3 = 3+8$ $\qquad$ $8*3 = 3*8$

Add/Mult order does not matter.

Associative Property

$(3+4)+5 = 3+(4+5)$

$(3*4)*5 = 3*(4*5)$

shift parenthesis in add/mult

Identity Property

Add $\quad 3+0 = 3 \qquad a+0=a$

Mult $\quad 3*1 = 3 \qquad a*1=a$

$$x+4=5$$
$$-4 \quad -4$$
$$x+0=1 \qquad x=1$$

Inverse Properties

Add $\quad 4+(-4)=0 \qquad a+(-a)=0$

add opposites → 0

Mult $\quad 4*\frac{1}{4}=1 \qquad a*\frac{1}{a}=1$

mult by inverse → 1

Distributive Property

Needham Slgp

$4(5+3) = 4(5) + 4(3)$

$3(a+b) = 3a + 3b$

1-2 Algebraic Expressions

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

substitute

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

$12 + 1 + 6$

$13 + 6 = \boxed{19}$

$6p^2 - (3p^2 + 2q^2) \qquad p = 1 \quad q = 5$

PEMDAS

$6(1)^2 - (3(1)^2 + 2(5)^2)$

$6(1)^2 - (3(1) + 2(25))$

$6(1)^2 - (3 + 50)$

$6(1)^2 - (53)$

$6(1) - 53$

$6 - 53 = \boxed{-47}$