S-A1 Algebra 1 Session 2 6/12

1.) 8 less than the sum of b and 9.

(less than: ⊖, sum: ⊕)

with "less than" switch order

$8 - b + 9 - 8$

$b + 9 - 8$ or $(b + 9) - 8$

2.) 12 more than the quotient of 8 and x

(more than: ⊕, quotient: ÷)

Algebraic expression:

$12 + 8 \div x$ $\quad 12 + \frac{8}{x}$

$\frac{8}{x} + 12$

3.) The difference between c and the product of 8 and b.

(difference: ⊖, product: *)

$c - 8 * b$ or $c - 8b$

4.) 9 less than a number increased by 3.

(switch; less than: ⊖, a number: f, increased: ⊕)

$f + 3 - 9$ or $(f + 3) - 9$

5.) The product of 8 and the sum of 14 and y.

(product: *, sum: +)

$8 * (14 + y)$ or $8(14 + y)$

Absolute value - the distance from the number to zero on the number line

$|-3| = 3$

$|3| = 3$

Magnitude

$|-4| + 9$

$4 + 9 = 13$

$|-8| - |-7| =$

$8 - 7 = 1$

$-|-2| = -(2) = -2$

$|2 - 7| + |-6|$

$|(2-7)| + |-6|$

$|-5| + |-6|$

$5 + 6 = 11$

Absolute value only changes the sign as the number is leaving the absolute value!

Rational [ratio]

Number that can be put into a fraction.

Irrational

Number that cannot be put into a fraction.

Rational Numbers

Counting numbers — 1, 2, 3, 4, ...

Whole numbers — 0, 1, 2, 3, 4, ... only difference is ∅

Integer — All whole numbers and their opposite.

$-4, -3, -2, -1, 0, 1, 2, 3, 4, \ldots$

0.45 terminal decimal $\frac{45 \div 5}{100 \div 5} = \frac{9}{20}$ Rational

$0.4444\ldots = 0.\overline{4}$ single repeat decimal $0.444\ldots = \frac{4}{9}$

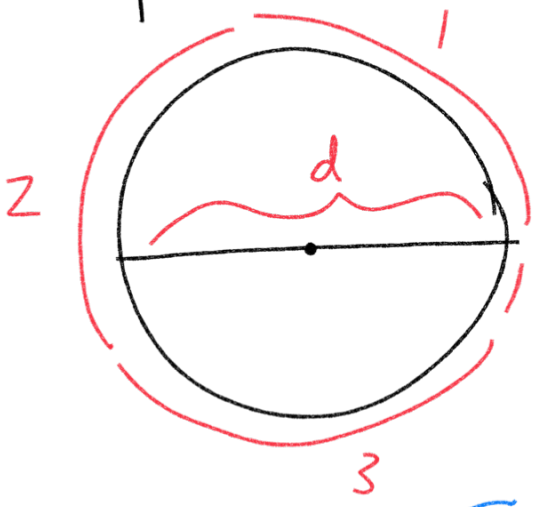
$0.7777\ldots = \frac{7}{9}$ Rational

$0.\overline{234}$ group repeat decimal $0.\overline{234} = \frac{234}{999}$

$0.124444\ldots = 0.12\overline{4}$ rational - repeating decimal.

$0.123456\ldots$ irrational - no repeat

π = pi 3.141592... ← No repeating pattern!



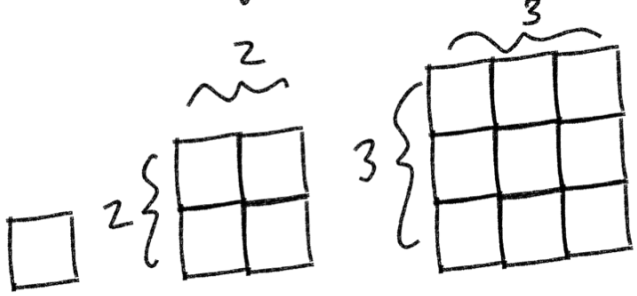
Pi is the number of times the diameter of a circle can wrap around its circumference.

Irrational

$C = \pi d$ $\pi = \frac{C}{d}$ ← can be put into a fraction.

Rational Numbers

Perfect Squares $\sqrt{4} = 2$ $\sqrt{9} = 3$



1 4 9

Consecutive odd numbers

1 → $\sqrt{0} = 0$

3 → $\sqrt{1} = 1$

5 → $\sqrt{4} = 2$

7 → $\sqrt{9} = 3$

9 → $\sqrt{16} = 4$

11 → $\sqrt{25} = 5$

13 → $\sqrt{36} = 6$

$\sqrt{49} = 7$

$\sqrt{40}$ → not a perfect square
irrational.

1.) 4 Rational
counting, whole, integer

2.) -7 Rational
integer

3.) 0.8888... Rational
repeating

4.) 0.143143□ Rational
terminal

$\frac{143143}{1000000}$ no...

5.) 0.347348... irrational

6.) 0.428428... rational
repeating

7.) $\sqrt{81}$ Rational
perfect square

8.) $\sqrt{200}$ irrational

Order of Operations

PEMDAS

P → parethesis

E → exponents

MD → multiplication / divisim

AS → addition / subtraction

$3 + 4 * 5$

1st option

$3+4*5$

$7*5$

~~35~~

2nd option

$3+4*5$

$3+20$

23

$3 + \underbrace{4 * 5}$

$3 + 5+5+5+5 = \boxed{23}$

$3 * 5^2$

1st option

$3 * 5^2$

15^2

~~225~~

2nd option

$3 * 5^2$

$3*25$

75

P

E

MD

AS

$3 * 5^2$

$3 * 5*5$

$(5+5+5) * 5$

$(5+5+5) + (5+5+5) + (5+5+5) + (5+5+5) + (5+5+5)$

75

Mult ⟷ Div Division is anti-multiplication

P
E
MD
AS

take these in order!! L→R

$\frac{1}{2} \div \frac{3}{4}$

$\frac{1}{2} * \frac{4}{3}$

Keep, change, Flip!

Add ⟷ Sub Subtraction is opposite of addition!

$7 - 5 = 7 + (-5)$

P
E
MD
AS

$4 + 3(15 - 2^3)$ $2^3 = 2 \cdot 2 \cdot 2 = 8$

$4 + 3(15 - 8)$

understood (*)

$4 + 3(7)$

$4 + 21 = \boxed{25}$

P P
E E
MD ⟷ DM
AS ⟷ SA

1.) $5 + 16 \div 2 + 7 * 4$

$5 + 8 + 7 * 4$

$5 + 8 + 28 = \boxed{41}$

2.) $8 + 4^2 * 12 - 2^3 \div 8$

$8 + 16 * 12 - 2^3 \div 8$

$8 + 16 * 12 - 8 \div 8$

$8 + 192 - 8 \div 8$

$8 + 192 - 1$

$200 - 1 = \boxed{199}$