June 30, 2015

$A \subseteq B$

* If all members of A are also members of B.

$A = \emptyset$

True or False

$A \subseteq B$?

$\{\} \subseteq B$

* If $A \subseteq B$ is false, then there is some member in A that is not in B.

$n(\emptyset) = 0$

$C = \{ \emptyset, \{a\}, \{1,2,3\} \}$

$n(C) = 3$

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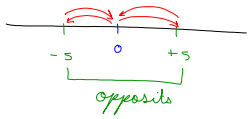
Addition of Integers

Opposits

* x & y are opposits if and only if (iff)

$x + y = 0$ ① → ← ②



Addition: $+5 + (-5) = 0$

$(-5) + +5 = 0$

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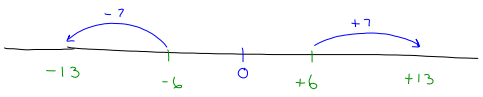
Addition in General of Integers

① If two numbers have the same "sign", then add and keep the sign.

① $(+6) + (+7) = +13$

② $(-6) + (-7) = -13$



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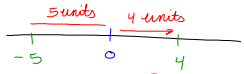
Opposite Signs

* Absolute Value (abs) of a number is its distance from zero.

– notation: $|a| = a$

$|4| = 4$



* Distance is always Positive.

$|-5| = 5$

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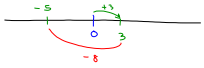
Adding number with opposite signs.

① Determine their absolute values.

② Find the "difference" between the two numbers

③ Attach the "sign" of the larger absolute value number.

$3 - 8 = 3 + (-8)$



① $|3| = 3$

② $|-8| = 8$ } $8 - 3 = -5$

Because $8 > 3$

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$-22 + 4$

$|-22| = 22$

$|4| = 4$

$22 > 4 \rightarrow 22 - 4 = -18$

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Multiplication of Integers

$2 \times 3 = 6$

* means three groups of 2

$\underbrace{2 + 2 + 2}_{\text{three groups}} = 6$

Rules

Same signs
1. Pos. × Pos. = Pos.
2. Neg. × Neg. = Pos.

opposite signs
3. Pos. × Neg. = Neg.
4. Neg. × Pos. = Neg.

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Division

Recall from 6.1

if $a \mid b$ (a divides b), then there is a "q" such that

$b = a \times q$

* Division is really multiplication

$a / b = c$ meaning $a = b \cdot c$

$b \mid a$ iff $b \cdot c = a$

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$$\frac{-10}{2} = 2 \mid -10 = -5$$

$-10 = 2 \cdot c$ ← must be neg.

$-10 = 2 \cdot (-5)$

$$\frac{2 \cdot x}{2} = \frac{-10}{2}$$

$1 \cdot x = -5$

$x = -5$

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Calculate → Simplify

$$\left(-4 \cdot (-1) \cdot (-9)\right) \cdot \left(\frac{-6 + (-2)}{9 - 5}\right)$$

$9 + (-5)$

(a thing) times (a thing)

multiply

$$\left(-4 + 9\right) \cdot \left(\frac{-8}{4}\right)$$

$(5) \cdot (-2)$

-10

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6.2 pg. 250

1, 4, 6, 7, 9, 15, 17, 25, 26, 27, 35, 39, 41, 43, 45, 49, 51

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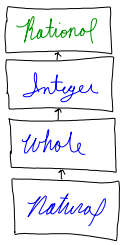
6.3



$\frac{5}{1}, \frac{-3}{1}, \frac{1}{2}, -\frac{3}{4}, \frac{17}{3}$, 0.5, 3.4

2 : 1 → $\frac{2}{1}$,

66% → $\frac{2}{3}$

Rational: $\mathbb{Q} = \left\{ \frac{a}{b} \mid a \text{ & } b \in \text{the Integers & } b \neq 0 \right\}$

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