S-A1 Algebra I Sessim 3 6/10

Rational / Irrational

1.) 0.7897897897... rational, repeating decimal

2.) 5 rational whole, counting, integer

3.) $\frac{3}{4}$ rational fraction

4.) $\sqrt{80}$ irrational

5.) 0.313131... rational terminal

6.) 0.98765... irrational

7.) -9 rational integer

8.) 0 rational whole, integer

9.) $\sqrt{81}$ rational perfect square

10.) 0.222... rational repeating

11.) 0.10102... rational terminal

12.) π irrational

PEMDAS

$2 + 3 * 4^2$

$2 + 3 * 16$

$2 + 48 = 50$

Parentheses

Exponents

Mult / Div ←→

Add / sub ←→

$2(27-13\cdot 2)$

$2(27-26)$

$2(1) = \boxed{2}$

1.) $50 \div 2 + 15 * 4$

$25 + 15 * 4$

$25 + 60 = \boxed{85}$

2.) $4 + 8 \div 2 + 6 * 3$

$4 + 4 + 6 * 3$

$4 + 4 + 18$

$8 + 18 = \boxed{26}$

3.) $14 + 6 * 2^3 - 8 \div 2^2$

L → R

$14 + 6 * 8 - 8 \div 4$

$14 + 48 - 8 \div 4$

$14 + 48 - 2$

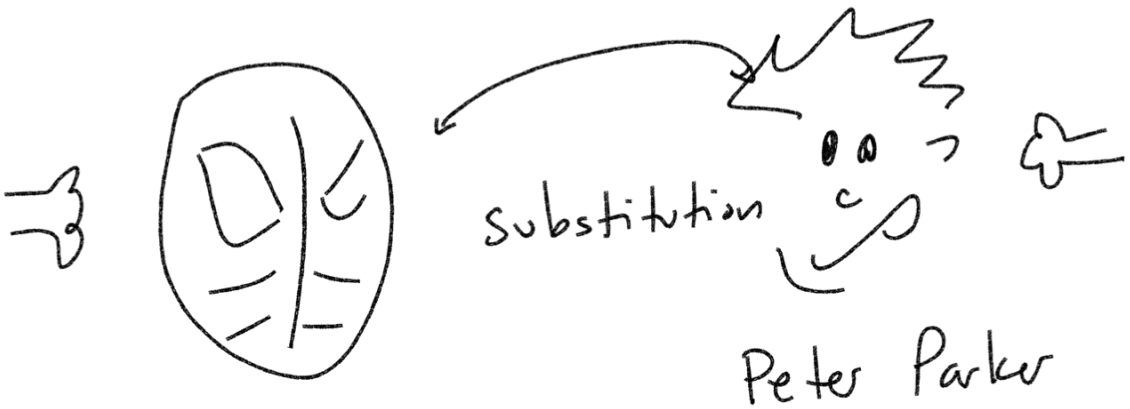
$62 - 2 = \boxed{60}$

4.) $4^2 + 5^2(8-3)$

$4^2 + 5^2(5)$

$16 + 25(5)$

$16 + 125 = \boxed{141}$



Spider-Man

Peter Parker

Algebraic Expression

$\frac{a + 2b}{5}$

$a = 1$ $\quad b = 2$

Not digit replacement

substitute

$2b = 2*b$

$\frac{1 + 2(2)}{5} \quad \frac{1+4}{5} = \frac{5}{5} = \boxed{1}$

Follow the order of operations —

Numerator and denominator contain parentheses.

$\frac{1 + 2(2)}{5} = \frac{(1+2(2))}{5}$

$x + 3y^2 \quad x = 3 \quad y = 4$

$\rightarrow 3 + 3(4)^2$

$3 + 3(16)$

$3 + 48 = \boxed{51}$

1.) $7a - 4(b+2)$ $\quad a = 2 \quad b = 5$

$7(2) - 4(5+2)$

$7(2) - 4(7) = 14 - 28 = -14$

2.) $(a^3 + b^2) \div a$ $\quad a = 3 \quad b = 2$

$(3^3 + 2^2) \div 3$

$(27 + 4) \div 3$

$31 \div 3 = \boxed{\frac{31}{3}} = 10.333\ldots = 10.\overline{3}$

Add Real Numbers

$-5 + 8 = \boxed{3}$

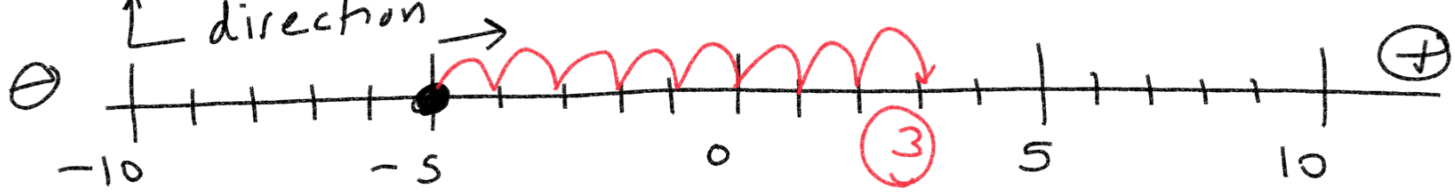
When adding numbers with <u>different</u> signs, we take their difference.

$8 - 5 = 3$

Larger number determines the sign. (+3)

start ← $-5 + 8$ ← move

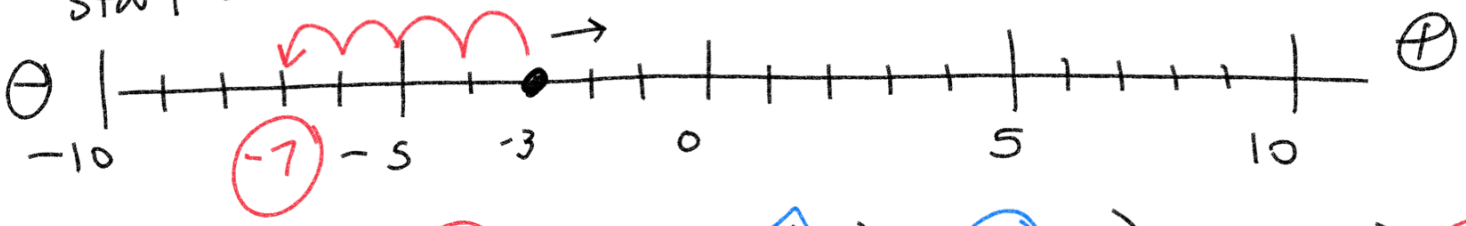
direction →



$-3 + (-4) = -7$ If we have numbers with the same sign, we take their sum ⊕

$-3 + (-4)$ go backwards $3 + 4 = -7$

start direction



1.) $4 + (-8) = -4$
Different → difference
$8 - 4 = 4$

2.) $12 + (-7) = 5$
Different → difference
$12 - 7 = 5$

3.) $-11 + (-3) = -14$
Same → sum
$11 + 3 = 14$

4.) $-9 + 3 = -6$
Different → difference
$9 - 3 = 6$

5.) $-1 + 8 = 7$

6.) $-13 + 7 = -6$

7.) $2 + 7 = 9$

8.) $-3 + (-15) = -18$

9.) $8 + 6 = 14$

10.) $-5 + (-8) = -13$

11.) $6 + 9 = 15$

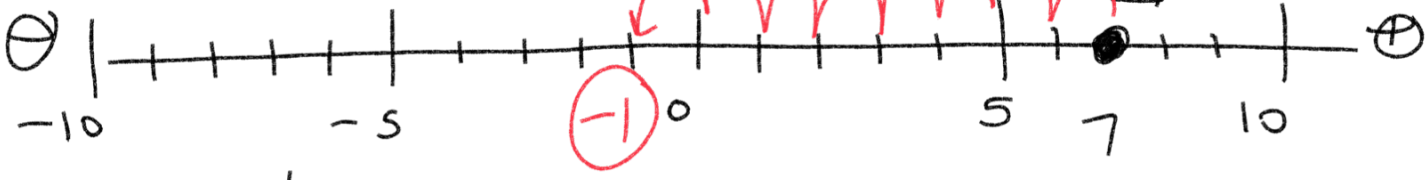
12.) $4 + (-11) = -7$

Subtracting Real Numbers

$7 - 8 = 7 + (-8) = -1$

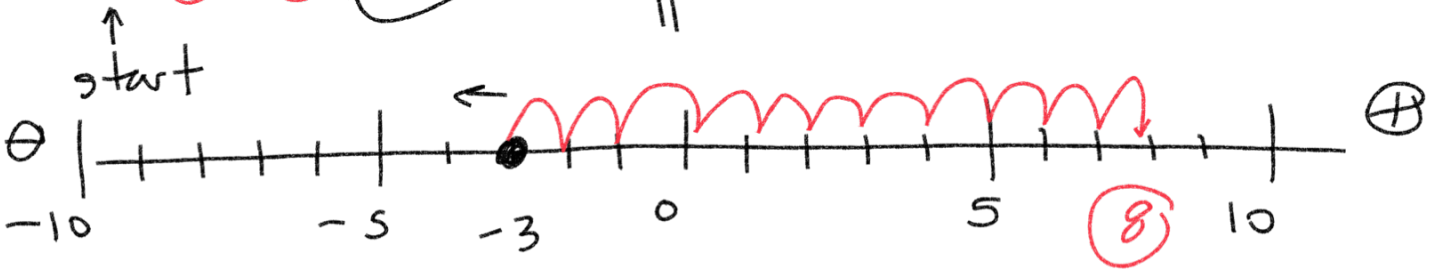
start, backwards 8, direction

$7 - 8 = 7 + (-8)$



direction, backwards 11, start

$-3 - (-11)$



$-3 - (-11)$

$-3 + 11 = +8$

$-3 - (-11)$ $\quad$ $-3 + (+11)$

same sign together $\rightarrow +$ $\quad$ $-3 + 11$ $\quad$ $-3 + 11$

different signs together $\rightarrow -$ $\quad$ $-3 + (-11)$ $\downarrow$ $-3 - 11$ $\quad$ $-3 - (+11)$ $\quad$ $-3 - 11$