S-A2 Algebra 2 Session 5 6/25

1.) $6 - 8(x-3) \geq 2x$

$6 - 8x + 24 \geq 2x$

$30 - 8x \geq 2x$

$+8x \quad +8x$

$\frac{30}{10} \geq \frac{10x}{10}$

$3 \geq x$

closed

$30 - 8x \geq 2x$

$-2x \quad -2x$

$30 - 10x \geq 0$

$-30 \quad -30$

$\frac{-10x}{-10} \geq \frac{-30}{-10}$

flip! when you mult/div by a negative

$x \leq 3$

3

three

2.) $3x - 5 \geq -8$ and $3x - 5 \leq 1$

$+5 \quad +5 \qquad +5 \quad +5$

convergent

$\frac{3x}{3} \geq \frac{-3}{3}$

$x \geq -1$

$\frac{3x}{3} \leq \frac{6}{3}$

$x \leq 2$

$-1 \qquad 2$

3.) $16 > |3x+1| \geq -8$

$-1 \qquad -1 \qquad -1$

$\frac{15}{3} > \frac{3x}{3} \geq \frac{-9}{3}$

$5 > x \geq -3$

$5 > x \qquad x \geq -3$

1.) $10 - x \geq -2(3+x)$

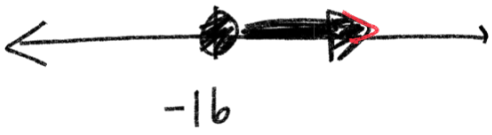
$\{ \; 10 - x \geq -6 - 2x$

$-10 \qquad\qquad -10$

$-x \geq -16 - 2x$

$+2x \qquad\quad +2x$

$\boxed{x} \geq -16$



2.) $2(x-1) < -4$ or $2(x-1) > 4$

$2x - 2 < -4$

$+2 \quad +2$

$\frac{2x}{2} < \frac{-2}{2}$

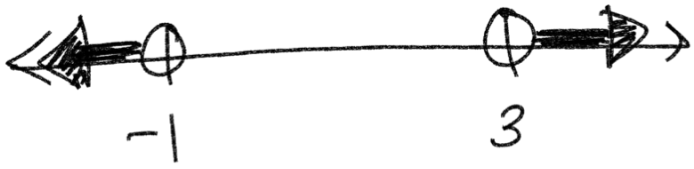
$x < -1$

$\frac{2(x-1)}{2} > \frac{4}{2}$

$x - 1 > 2$

$+1 \quad +1$

$x > 3$



3.) $-10 \leq 4x + 2 \leq 10$

$-2 \quad -2 \quad -2$

$\frac{-12}{4} \leq \frac{4x}{4} \leq \frac{8}{4}$

$-3 \leq x \leq 2$

Absolute Value – Distance from a number to zero on the number line.

$|5| = 5$ $\quad$ $|-5| = 5$

$$|2x-7| = 5$$

positive $\quad$ negative

$2x - 7 = 5$

$+7 \quad +7$

$\frac{2x}{2} = \frac{12}{2}$

$\boxed{x = 6}$

$2x - 7 = -5$

$+7 \quad +7$

$\frac{2x}{2} = \frac{2}{2}$

$\boxed{x = 1}$

1, 6

6, 1

$|x - 3| = -1$

Absolute values always equal a positive!

$\boxed{\text{No solution}}$

Make sure you isolate the absolute value first.

ns

$\frac{-3|x+2|}{-3} = \frac{-6}{-3}$

$|x+2| = 2$ has solutions!

$|x+7| = 2x+8$ check

$|x+7| = \pm(2x+8)$

positive

negative (opposite) $-(2x-8)$

$x+7 = 2x+8$

$-7 \quad -7$

$x = 2x+1$

$-2x \quad -2x$

$\frac{-x}{-1} = \frac{1}{-1}$ $\quad x = -1$ ✓

only solution

$x = -1$

$2x+8$

$2(-1)+8$

$-2+8$

$+6$ ✓

$x+7 = -2x-8$

$+2x \quad +2x$

$3x+7 = -8$

$-7 \quad -7$

$\frac{3x}{3} = \frac{-15}{3}$

$x = -5$ ✗

Trust!
No one.

$x = -5$

$2x+8$

$2(-5)+8$

$-10+8$

-2 ✗

$$\frac{-3|x+4|}{-3} = \frac{-12}{-3}$$

First isolate the absolute value

$$|x+4| = 4$$

No check
No x in the right!

$x+4=4$
$-4 \quad -4$
$x=0$

$x+4=-4$
$-4 \quad -4$
$x=-8$

$$|3x+15| + 8 = 6$$
$$-8 \quad -8$$

$|3x+15| = -2$ equals negative

No solution

ns

$|5x-7| = 3x-7$

$-1(3x-7)$

opposite

$5x-7 = 3x-7$

$+7 \quad +7$

$5x = 3x$

$-3x \quad -3x$

$\frac{2x}{2} = \frac{0}{2}$

$x = 0$

$5x-7 = -3x+7$

$+7 \quad +7$

$5x = -3x+14$

$+3x \quad +3x$

$\frac{8x}{8} = \frac{14}{8}$

$x = \frac{7}{4}$

No solution

$3x-7$

$3(0)-7$

-7

Negative

$3\left(\frac{7}{4}\right)-7$

$\frac{21}{4}-7$

$5.25-7 = -1.75$

Negative

$|x+5| > 12$

$-1(12)$

opposite — flip inequality and take the negative!

$x+5 > 12$

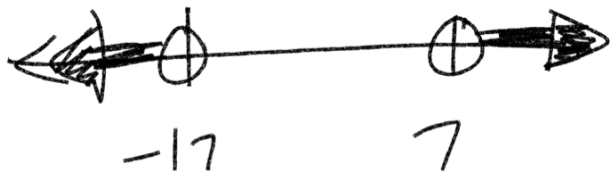
$-5 \quad -5$

$x > 7$

$x+5 < -12$

$-5 \quad -5$

$x < -17$



$|x+3| > -8$ Always! All solutions or All Real Numbers $\mathbb{R}$

$|x+3| < -8$ No solution

Candy

York	8
Skittles	16
Twix	24
Sour Patch	12
total	60

$P(\text{Skittles}) = \frac{16 \div 4}{60 \div 4} = \frac{4}{15}$

Desired / Total

$P(\text{Twix}) = \frac{24 \div 12}{60 \div 12} = \frac{2}{5}$

$P(\text{York or Sour Patch}) = \frac{8+12}{60}$

$\frac{20}{60} = \frac{1}{3}$

$P(\text{Twizzler}) = 0$

Candy

York	8
Skittles	16
Twix	24
Sour Patch	12
total	60

P(York and then Twix with Replacement)

$P(\text{York}) * P(\text{Twix})$

$\frac{8}{60} = \frac{2}{15} * \quad \frac{24}{60} = \frac{2}{5}$

$\frac{2}{15} * \frac{2}{5} = \frac{4}{75}$

$P(\text{Skit}) = \frac{16}{60} = \frac{4}{15}$

P(Skittles and then Sour Patch without Replacement)

$P(SP) = \frac{12}{60-1}$

$\frac{4}{\cancel{15}_{5}} * \frac{\cancel{12}^{4}}{59} = \boxed{\frac{16}{295}}$

Candy

York	8
Skittles	16
Twix	24
Sour Patch	12
total	60

P(Skittles and then York with replacement)

$\frac{16}{60} = \frac{4}{15} * \frac{2}{15} = \frac{8}{225}$

P(Twix and the twix without replacement)

$P(\text{Twix}) = \frac{24}{60} = \frac{2}{5}$

$P(2^{nd} \text{ twix}) = \frac{23}{59}$

$\frac{2}{5} * \frac{23}{59} = \frac{46}{295}$