

S-A2 Algebra 2 Session 4 6/21

$$1.) \quad 7 + 13(x+1) \leq 3x$$

$$7 + 13x + 13 \leq 3x$$

$$13x + 20 \leq 3x$$

$$-13x$$

$$\frac{20}{-10} \leq \frac{-10x}{-10}$$

$$-2 \geq x$$

$$x \leq -2$$



flip whenever  
you divide/mult  
by negative

$$2.) \quad \begin{array}{r} 3x - 5 \geq -8 \\ +5 \quad +5 \end{array}$$

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

$$x \geq -1$$

and

$$3x - 5 \leq 1$$

$$+5 \quad +5$$

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

$$x \leq 2$$

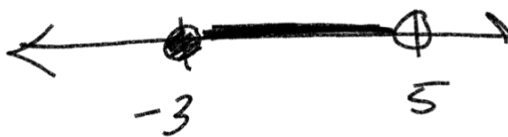
means convergent



$$3.) \quad \begin{array}{r} 16 > 3x + 1 \geq -8 \\ -1 \quad -1 \quad -1 \end{array}$$

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

$$5 > x \geq -3$$



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

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

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

$$10 + x \geq -6$$

$$-10 \qquad -10$$

$$x \geq -16$$



$$2.) \quad 2(x-1) < -4 \quad \text{or} \quad 2(x-1) > 4$$

*divergent*

$$2x - 2 < -4$$

$$+2 \quad +2$$

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

$$x < -1$$

$$2x - 2 > 4$$

$$+2 \quad +2$$

$$\frac{2x}{2} > \frac{6}{2}$$

$$x > 3$$



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

$$-2 \qquad -2 \qquad -2$$

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

$$-3 \leq x \leq 2$$



$$-3 \leq (x) \quad x \geq -3$$



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

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

$$|2x-7| = 5$$
$$2x-7 = 5 \quad \oplus$$
$$2x-7 = -5 \quad \ominus$$

$$2x-7 = 5$$
$$+7 \quad +7$$

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

$$2x-7 = -5$$
$$+7 \quad +7$$

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

$$\boxed{x=6 \quad x=1}$$

$$|x-3| = -1$$

No Solution!

$\boxed{ns}$

$$\cancel{x=2} \quad |2-3| = |-1| = 1$$

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

$$x + 7 = 2x + 8$$

$-7$                        $-7$

$$x = 2x + 1$$

$-2x$     $-2x$

$$-x = 1$$

$\underline{-1}$     $\underline{-1}$

$$x = -1$$

$$2x + 8$$

$$2(-1) + 8$$

$-2 + 8$   
 $6$  ✓

$$x + 7 = -(2x + 8)$$
$$x + 7 = -2x - 8$$

$+2x$                        $+2x$

$$3x + 7 = -8$$

$-7$     $-7$

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

$$x = -5$$

not a solution

$$2(-5) + 8$$

$-10 + 8$   
 $-2$

cannot be negative!

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

we have to isolate absolute value first!

$$|x+4| = 4$$

no x,  
no worries

$$\begin{array}{r} x+4=4 \\ -4 \quad -4 \end{array}$$

$$x=0$$

$$\begin{array}{r} x+4=-4 \\ -4 \quad -4 \end{array}$$

$$x=-8$$

not isolated!

$$\begin{array}{r} |3x+15| + 8 = 6 \\ -8 \quad -8 \end{array}$$

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

no solution!

$$|5x - 1| = 3x - 7$$

$$5x - 1 = 3x - 7$$

$-3x$        $-3x$

$$2x - 1 = -7$$

$+1$        $+1$

$$\frac{2x}{2} = \frac{-6}{2}$$

~~$x = -3$~~

$$3(-3) - 7$$

$$-9 - 7 = -16$$

$$5x - 1 = -(3x - 7)$$

$$5x - 1 = -3x + 7$$

$+3x$        $+3x$

$$8x - 1 = 7$$

$+1$        $+1$

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

~~$x = 1$~~

$$3(1) - 7$$

$$3 - 7 = -4$$

if Both  
Bad,  
no solution  
 $3x - 7$   
cannot be  
negative!

$$|x + 5| > 12$$

flip inequality  
and  
take the negative!

$$x + 5 > 12$$

-5      -5

$$x + 5 < -12$$

-5      -5

$$x > 7$$

$$x < -17$$



$$|x + 3| > -8$$

Always  
all solutions  
or  
All Real Numbers  
TR

$$|x + 3| < -8$$

impossible

No solution

## Candy

Charleston Chew 8

Reese's Cup 24

Hershey's 12

York 20

Heath 16

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total 80

$$P(\text{Heath}) = \frac{16 \div 16}{80 \div 16} = \boxed{\frac{1}{5}}$$

$$\frac{\text{Desired \#}}{\text{total \#}}$$

$$P(\text{Reese's}) = \frac{24 \div 8}{80 \div 8} = \boxed{\frac{3}{10}}$$

$$P(\text{C Chew or Hershey's})$$

$$\begin{array}{c} \downarrow \qquad \downarrow \\ \frac{8 + 12}{80} = \frac{20 \div 20}{80 \div 20} = \boxed{\frac{1}{4}} \end{array}$$

## Candy

Charleston Chew 8

Reese's Cup 24

Hershey's 12

York 20

Heath 16

---

total 80

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

P(Hershey and then York  
with replacement)

$$\begin{array}{cc} \text{Hershey} & \text{York} \\ \downarrow & \downarrow \\ \frac{12 \div 4}{80 \div 4} = \frac{3}{20} & \frac{20 \div 20}{80 \div 20} = \frac{1}{4} \end{array}$$

$$\frac{3}{20} * \frac{1}{4} = \boxed{\frac{3}{80}}$$



Candy

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---

total 80

P(Reese's and the C Chew with replacement)

Reese's	C Chew
↓	↓
$\frac{24 \div 8}{80 \div 8} = \frac{3}{10}$	$\frac{8 \div 8}{80 \div 8} = \frac{1}{10}$

$\frac{3}{10} * \frac{1}{10} = \boxed{\frac{3}{100}}$

Candy

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Hershey's 12

York 20

Heath 16

---

total 80

P(Heath and then York without replacement)

Heath	York
↓	↓
$\frac{16 \div 16}{80 \div 16} = \frac{1}{5}$	$\frac{20}{79}$ ← since no replacement

$\frac{1}{5} * \frac{20}{79} = \frac{4}{79}$   
 $\frac{1}{5} \xrightarrow{\div 5} \frac{1}{1}$      $\frac{20}{79} \xrightarrow{\div 5} \frac{4}{79}$   
 $\frac{1}{1} * \frac{4}{79} = \boxed{\frac{4}{79}}$

Candy

Charleston Chew 8

Reese's Cup 24

Hershey's 12

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Heath 16

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total 80

P(Hershey and then a  
hershey without  
replacement)

Hershey  
↓

$$\frac{12}{80} \div 4 = \frac{3}{20}$$

Hershey  
↓

$$\frac{11}{79}$$

$$\frac{3}{20} * \frac{11}{79} =$$

33
1580