

SPECIAL CASE

“infinite number of solutions”

$$2n - 5 + 7n < 3(3n + 4)$$

Distribute

$$2n - 5 + 7n < 9n + 12$$

C.L.T.

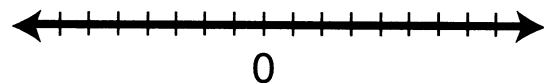
$$9n - 5 < 9n + 12$$

Add $-9n$

$$9n - 5 + ^{-}9n < 9n + 12 + ^{-}9n$$

$$-5 < 12 \quad \text{True}$$

$S = \{\text{all real numbers}\}$



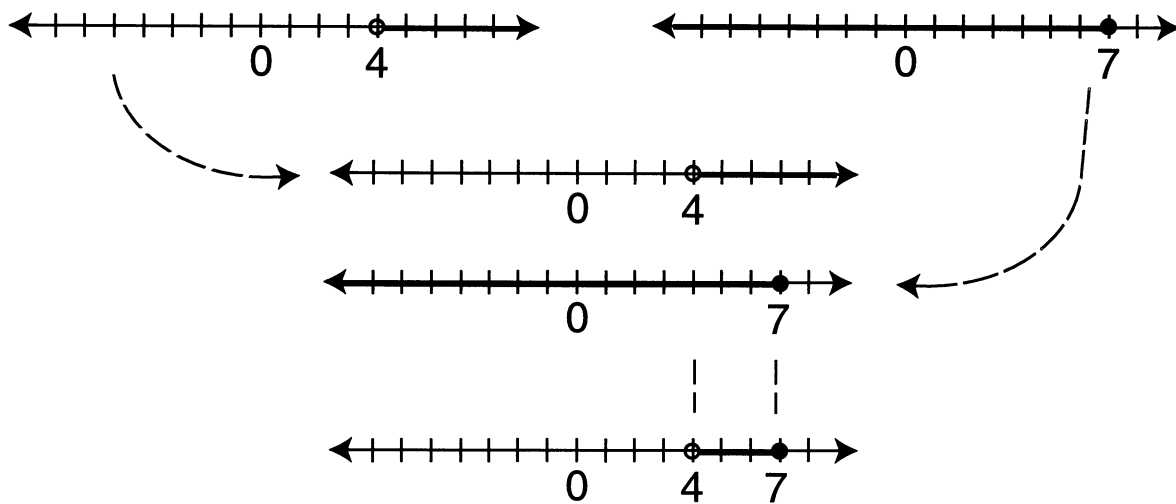
“When placeholders disappear,
if a true statement is left,
the solution set contains
all real numbers.”

COMPOUND SENTENCES "AND"

(at the same time)

	$3n - 2$	> 10		$2n + 4$	≤ 18
Add 2	$3n - 2 + 2$	$> 10 + 2$	Add -4	$2n + 4 + -4$	$\leq 18 + -4$
	$3n$	> 12		$2n$	≤ 14
Mult. $\frac{1}{3}$	$\frac{1}{3}(3n)$	$> \frac{1}{3}(12)$	Mult. $\frac{1}{2}$	$\frac{1}{2}(2n)$	$\leq \frac{1}{2}(14)$
	n	$> \frac{12}{3}$ or $4 \checkmark$		n	$\leq \frac{14}{2}$ or $7 \checkmark$

"and"



$$-3 < 5m + 1 < 10$$

$$-3 < 5m + 1 \quad \text{"and"} \quad 5m + 1 < 10$$

⋮

⋮

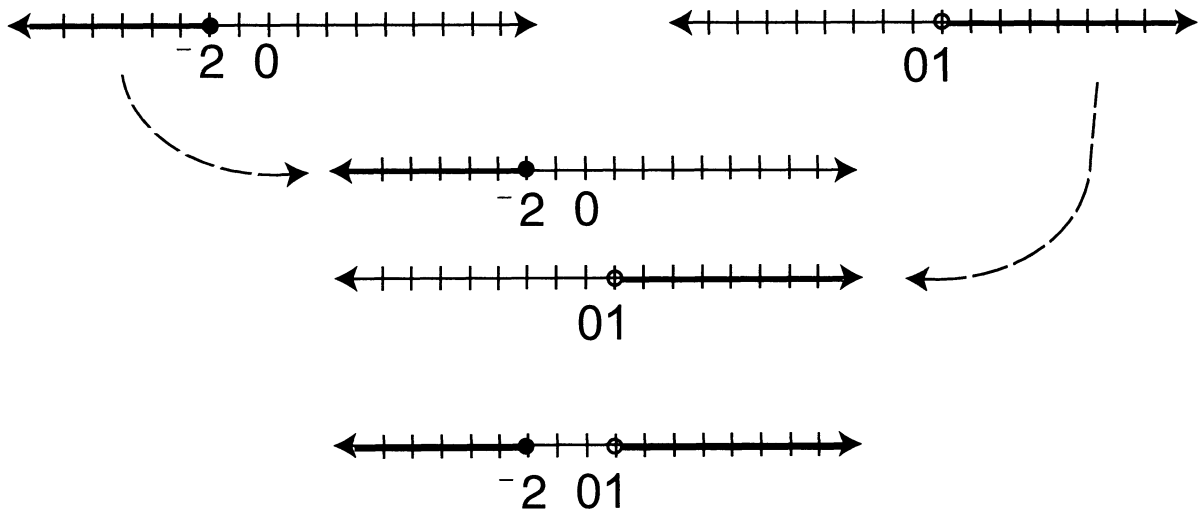
COMPOUND SENTENCES

“OR”

(one or the other or both)

	$2y - 3 \leq -7$		$3y + 1 > 4$
Add 3	$2y - 3 + 3 \leq -7 + 3$	Add -1	$3y + 1 +^{-1} > 4 +^{-1}$
	$2y \leq -4$		$3y > 3$
Mult. $\frac{1}{2}$	$\frac{1}{2}(2y) \leq \frac{1}{2}(-4)$	Mult. $\frac{1}{3}$	$\frac{1}{3}(3y) > \frac{1}{3}(3)$
	$1y \leq \frac{-4}{2} \text{ or } -2 \checkmark$		$1y > \frac{3}{3} \text{ or } 1 \checkmark$

“or”



ABSOLUTE VALUE

“Equal to a Non-Negative Number”

$$|n| = 8$$

$$\swarrow \qquad \searrow$$

$$n = -8 \qquad \text{“or”} \qquad n = +8$$

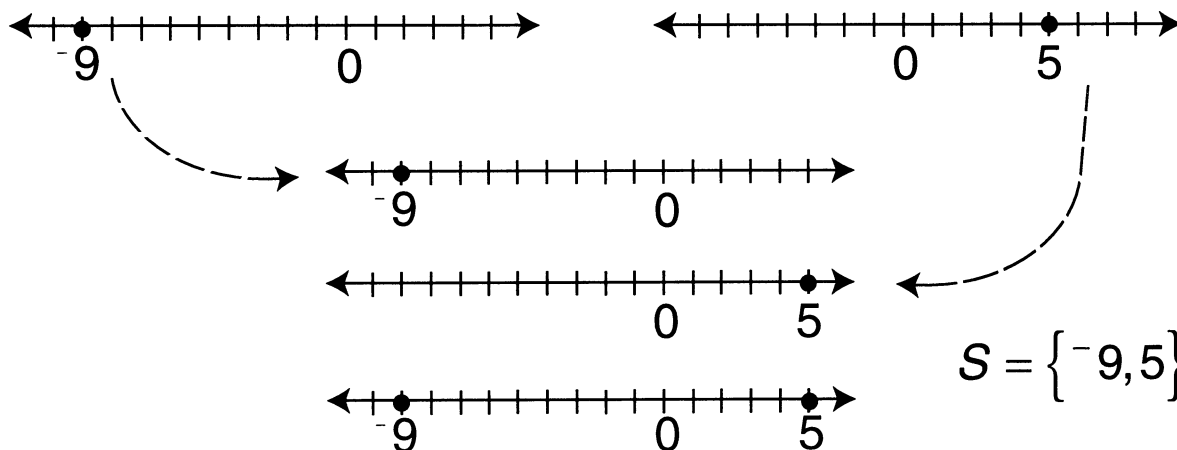
$$S = \{-8, +8\}$$

$$|2m + 4| = 14$$

$$\swarrow \qquad \searrow$$

$2m + 4 = -14$ <p>Add -4</p> $2m + 4 +^{-}4 = -14 +^{-}4$ $2m = -18$ <p>Mult. $\frac{1}{2}$</p> $\frac{1}{2}(2m) = \frac{1}{2}(-18)$ $1m = \frac{-18}{2} \text{ or } -9 \checkmark$	$2m + 4 = +14$ <p>Add -4</p> $2m + 4 +^{-}4 = +14 +^{-}4$ $2m = 10$ <p>Mult. $\frac{1}{2}$</p> $\frac{1}{2}(2m) = \frac{1}{2}(10)$ $1m = \frac{10}{2} \text{ or } 5 \checkmark$
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“or”

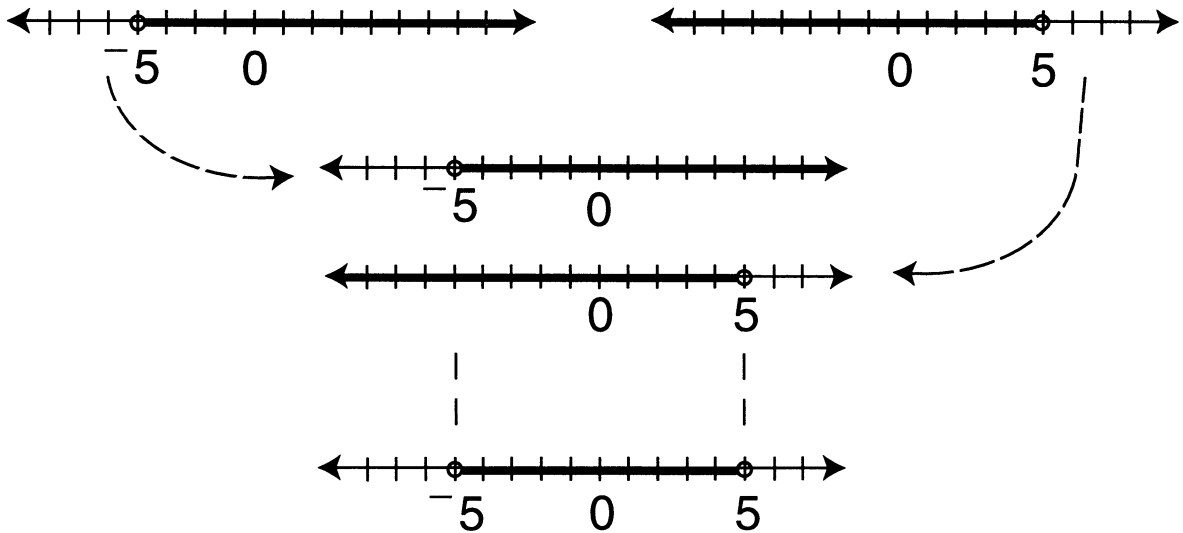


ABSOLUTE VALUE

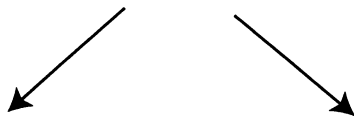
“Less than a Non-Negative Number”
 (less than a Positive Number)

$$|x| < 5$$

$$x > -5 \quad \text{“and”} \quad x < +5$$



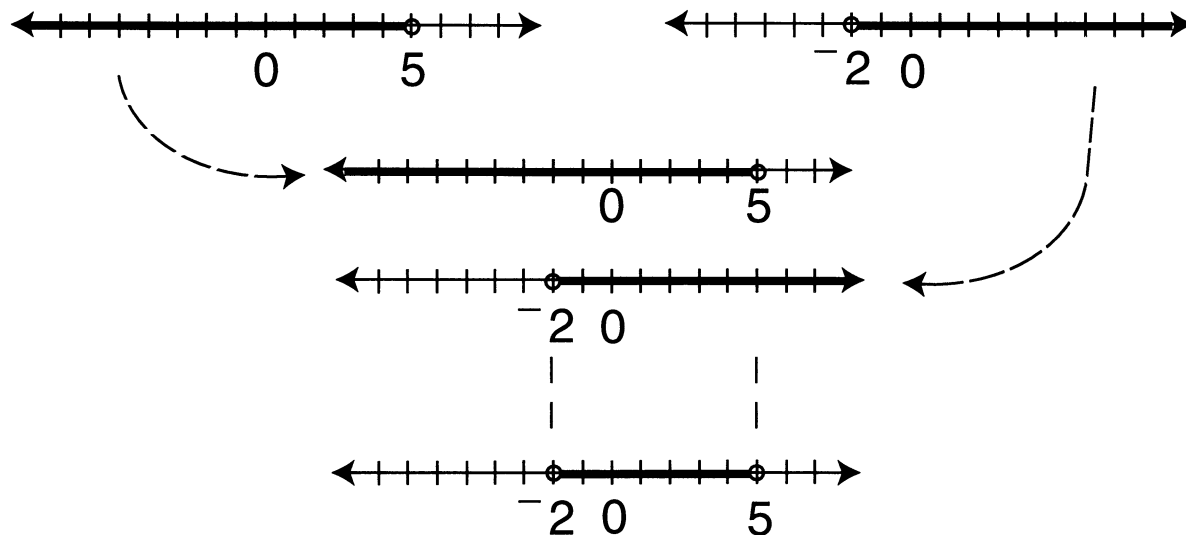
$$|-2y + 3| < 7$$



$$\begin{array}{l}
 -2y + 3 > -7 \\
 \text{Add } -3 \quad -2y + 3 + -3 > -7 + -3 \\
 -2y > -10 \\
 \text{Mult. } \frac{1}{-2} \quad \frac{1}{-2}(-2y) < \frac{1}{-2}(-10) \\
 1y < \frac{-10}{-2} \text{ or } 5 \checkmark
 \end{array}$$

$$\begin{array}{l}
 -2y + 3 < +7 \\
 \text{Add } -3 \quad -2y + 3 + -3 < +7 + -3 \\
 -2y < 4 \\
 \text{Mult. } \frac{1}{-2} \quad \frac{1}{-2}(-2y) > \frac{1}{-2}(4) \\
 1y > \frac{4}{-2} \text{ or } -2 \checkmark
 \end{array}$$

“and”



ABSOLUTE VALUE

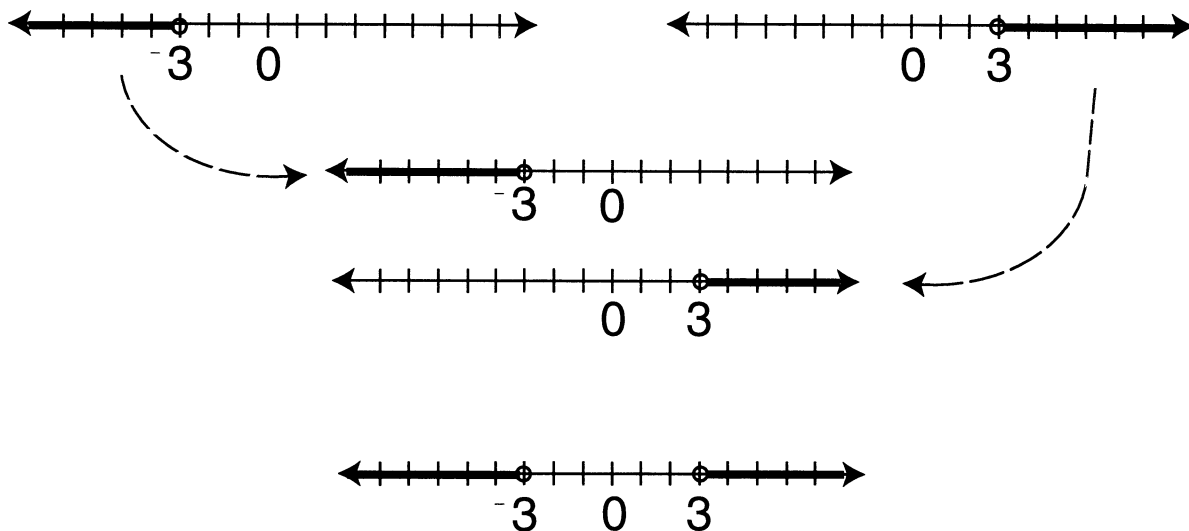
“Greater than a Non-Negative Number”

$$|c| > 3$$

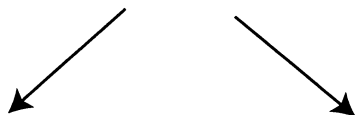
$$c < -3$$

“or”

$$c > +3$$



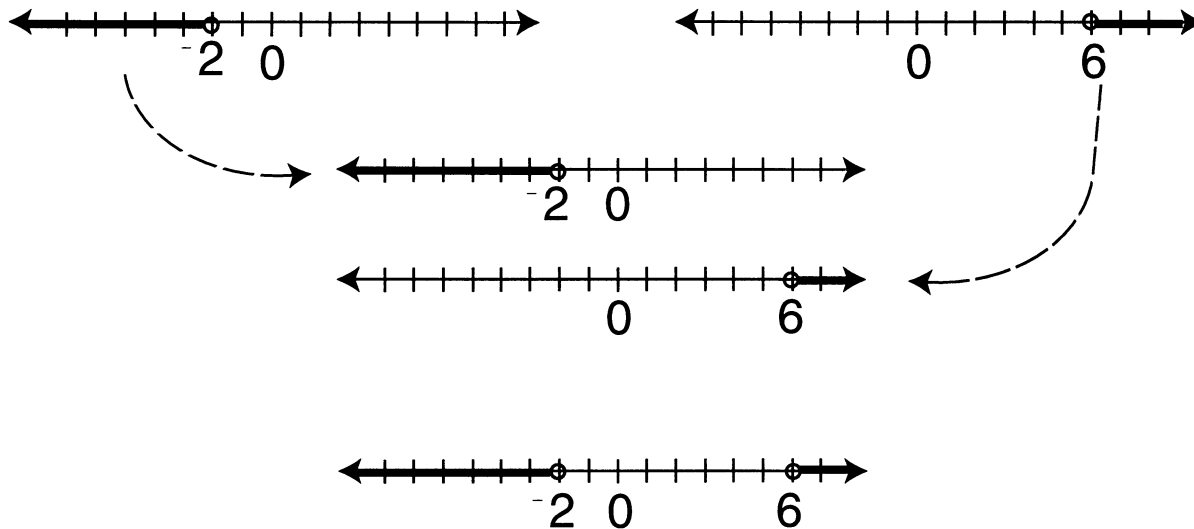
$$|3x - 6| > 12$$



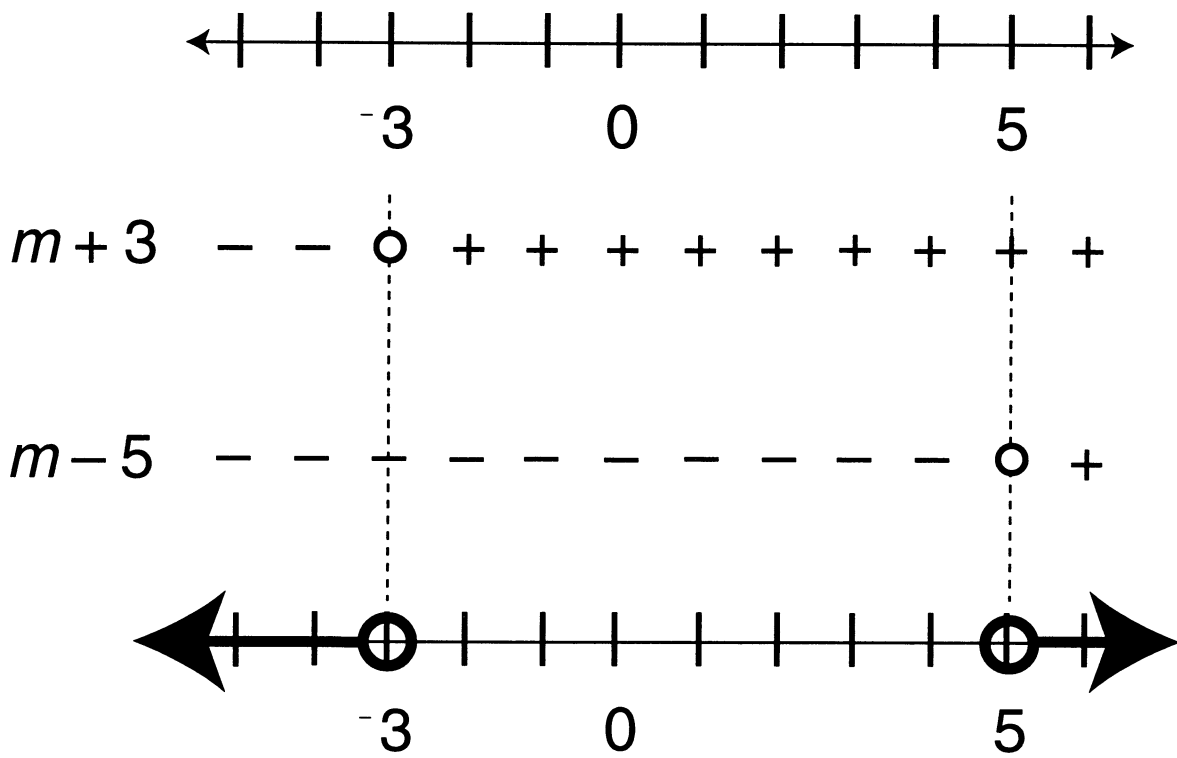
	$3x - 6$	< -12
Add 6	$3x - 6 + 6$	$< -12 + 6$
	$3x$	< -6
Mult. $\frac{1}{3}$	$\frac{1}{3}(3x)$	$< \frac{1}{3}(-6)$
	$1x$	$< \frac{-6}{3}$ or -2 ✓

	$3x - 6$	$> +12$
Add 6	$3x - 6 + 6$	$> +12 + 6$
	$3x$	> 18
Mult. $\frac{1}{3}$	$\frac{1}{3}(3x)$	$> \frac{1}{3}(18)$
	$1x$	$> \frac{18}{3}$ or 6 ✓

“or”



$$\frac{m + 3}{m - 5} > 0$$



$$\frac{(x + 17)}{(2x - 5)(x + 4)} < 0$$

