

1.4 SOLVING INEQUALITIES

CONSIDER $2 < 3$

$$\begin{array}{ccc} 2(-1) & & 3(-1) \\ -2 & > & -3 \end{array}$$

NOTE: THE INEQUALITY SIGN
REVERSES WHEN MULTIPLYING
(OR DIVIDING) BY A NEGATIVE.

EX SOLVE AND GRAPH

$$-2x < 3(x-5)$$

$$-2x < 3x - 15$$

$$\underline{-3x} \quad \underline{-3x}$$

$$\underline{\frac{-5x}{-5}} < \underline{\frac{-15}{-5}}$$

$$x > 3$$



NOTE: OPEN CIRCLE SINCE $x > 3$

IF $x \geq 3$, CLOSED CIRCLE



Ex1 Solve $7x \geq 7(2+x)$

$$\begin{array}{r} 7x \geq 14 + 7x \\ \underline{-7x} \qquad \underline{-7x} \end{array}$$

$$0 \geq 14$$

FALSE, NO SOLUTION



COMPOUND INEQUALITIES

Ex1 $3x + 9 < -3$ OR $-2x + 1 \leq 5$

$$3x < -12$$

$$x < -4$$

OR

$$-2x \leq 4$$

$$x \geq -2$$

↑ Flip



Ex1 $2x - 1 \leq 3x$ AND $x > 4x - 9$

$$-1 \leq x$$

$$x \geq -1$$

AND

$$-3x > -9$$

$$x < 3$$

↑ flip



Ex) SOLVE

$$\begin{array}{ccc} -3 & \leq & 4x - 1 & \leq & 11 \\ \hline +1 & & +1 & & +1 \end{array}$$

$$\begin{array}{ccc} -2 & \leq & 4x & \leq & 12 \\ \hline 4 & & 4 & & 4 \end{array}$$

$$-\frac{1}{2} \leq x \leq 3$$



H.W. 6-13, 20-23, 29-34, 41-46