

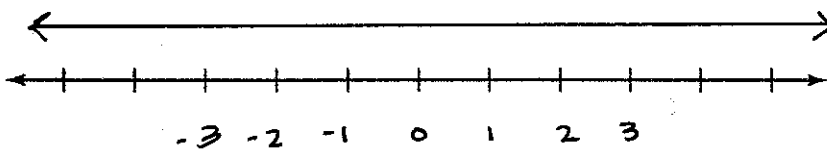
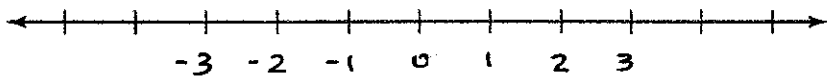
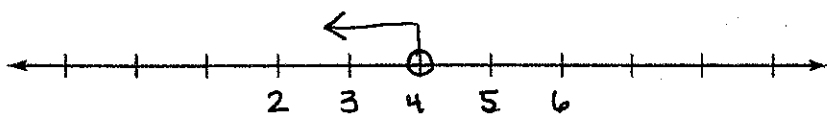
2.4 Notetaking with Vocabulary

Learning target: Understand solving ^{linear} linear inequalities.

Success criteria: I can solve multi-step linear inequalities.

Notes:

Types of solution sets?



$$\begin{aligned}
 6x - 5 &< 2x + 11 \\
 -2x &\quad -2x \\
 \hline
 4x - 5 &< 11 \\
 +5 &\quad +5 \\
 \hline
 4x &< 16 \\
 \frac{4x}{4} &\quad \frac{16}{4} \\
 x &< 4
 \end{aligned}$$

$$\begin{aligned}
 8b - 3 &> 4(2b + 3) \\
 8b - 3 &> 8b + 12 \\
 -8b &\quad -8b \\
 \hline
 -3 &> 12 \quad \text{False} \\
 \text{No solution} &\quad \{ \}
 \end{aligned}$$

$$\begin{aligned}
 2(5w - 1) &\leq 7 + 10w \\
 10w - 2 &\leq 7 + 10w \\
 -10w &\quad -10w \\
 \hline
 -2 &\leq 7 \quad \text{True}
 \end{aligned}$$

all real #'s are solutions
 \mathbb{R}

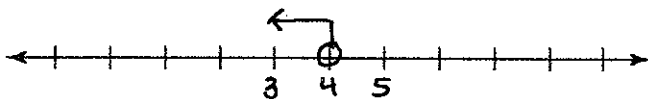
2.4 Notetaking with Vocabulary (continued)

Practice

In Exercises 1–5, solve the inequality. Graph the solution.

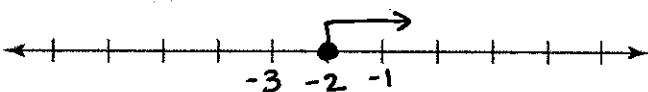
1. $3x - 2 < 10$
 $\quad +2 \quad +2$

$\frac{3x}{3} < \frac{12}{3} \quad x < 4$



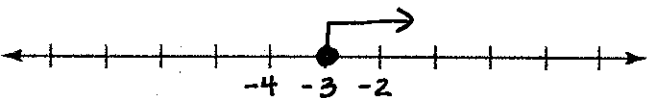
2. $4a + 8 \geq 0$
 $\quad -8 \quad -8$

$\frac{4a}{4} \geq \frac{-8}{4} \quad a \geq -2$



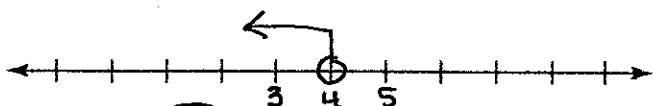
3. $2 + \frac{b}{-3} \leq 3$
 $\quad -2 \quad -2$

$-2 \cdot \frac{b}{-3} \leq 1 \cdot -3$
 $b \geq -3$



4. $\frac{c}{2} - 6 > -8$
 $\quad +6 \quad +6$

$\frac{c}{2} > -2 \cdot -2 \quad c < 4$



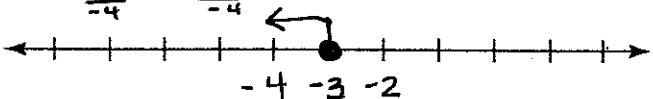
5. $8 \leq -4(d+1)$

$8 \leq -4d - 4$
 $+4 \quad +4$

$-3 \geq d$

$\frac{12}{-4} \leq \frac{-4d}{-4}$

$d \leq -3$



2.4 Notetaking with Vocabulary (continued)

In Exercises 6–10, solve the inequality.

6. $5 - 2n > 8 - 4n$
 $\quad +4n \quad +4n$
 $\frac{5}{-5} + 2n > \frac{8}{-5}$ $\frac{2n}{2} > \frac{3}{2}$ $n > \frac{3}{2}$ $n > 1.5$ $n > 1\frac{1}{2}$

7. $6h - 18 < 6h + 1$
 $\quad -6h \quad -6h$
 $-18 < 1$ True, all real #'s are solutions, \mathbb{R}

8. $3p + 4 \geq -4p + 25$
 $\quad +4p \quad +4p$
 $7p + 4 \geq 25$
 $\quad -4 \quad -4$
 $\frac{7p}{7} \geq \frac{21}{7}$
 $p \geq 3$

9. $7j - 4j + 6 < -2 + 3j$
 $\quad 3j + 6 < -2 + 3j$
 $\quad -3j \quad -3j$
 $6 < -2$ False, no solution

10. $12\left(\frac{1}{4}w + 3\right) \leq 3(w - 4)$
 $\quad 3w + 36 \leq 3w - 12$
 $\quad -3w \quad -3w$
 $36 \leq -12$ False, no solution

11. Find the value of k for which the solution of the inequality $k(4r - 5) \geq -12r - 9$ is all real numbers. $k = -3$
 $-3(4r - 5) \geq -12r - 9$
 $-12r + 15 \geq -12r - 9$
 $\quad +12r \quad +12r$
 $15 \geq -9$ True, all real #'s are solutions.

12. Find the value of k that makes the inequality $2kx - 3k < 2x + 4 + 3kx$ have no solution.

$\begin{aligned} 2kx &= 2x + 3kx \\ -3kx &\quad -3kx \\ \hline -kx &= 2x \\ -k &= 2 \end{aligned}$	}	$\begin{aligned} 2kx &= 2x + 3kx \\ 2kx &= x(2 + 3k) \\ (2k)x &= (2 + 3k)x \\ \hline 2k &= 2 + 3k \\ -3k &\quad -3k \\ \hline -k &= 2 \end{aligned}$	$\begin{aligned} 2(-2)x - 3(-2) &< 2x + 4 + 3(-2)x \\ -4x + 6 &< 2x + 4 - 6x \\ -4x + 6 &< -4x + 4 \\ \quad +4x \quad \quad +4x \\ \hline 6 &< 4 \text{ False} \end{aligned}$
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Look at Example 4 on page 76.