

*AAT

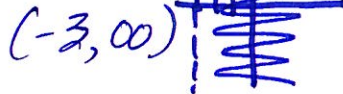
Chapter 2: 2-6 Inequalities (IC/HW)-Day 1

Express the inequality as an interval, and sketch its graph.

1. $x < -2$



2. $x > -3$



Express the interval as an inequality in the variable x.

5. $(-5, 8]$

$-5 < x \leq 8$

6. $[-4, -1]$

$-4 \leq x \leq -1$

7. $(-3, \infty)$

$x > -3$

8. $(-\infty, -5)$

$x < -5$

Solve the inequality, and express the solutions in terms of intervals whenever possible.

9. $3x - 2 > 14$

$3x > 16$

$x > \frac{16}{3}$

$(\frac{16}{3}, \infty)$

10. $3 - 5x < 11$

$-5x < 8$

$x > -\frac{8}{5}$

$(-\frac{8}{5}, \infty)$

11. $9 + \frac{1}{3}x \geq 4 - \frac{1}{2}x$

$(\frac{6}{5}) \frac{5}{6}x \geq -5(\frac{6}{5})$

$x \geq -6$

$[-6, \infty)$

12. $4 \geq 3x + 5 > -1$

$-1 \geq 3x > -6$

$-\frac{1}{3} \geq x > -2$

$(-2, -\frac{1}{3}]$

13. $3 \leq \frac{2-3x}{5} < 7$

$15 \leq 2-3x < 35$

$\frac{12}{-3} \leq \frac{-3x}{-3} < \frac{33}{-3}$

$-\frac{12}{3} \geq x > -11$

$(-11, -\frac{13}{3}]$

14. $-2 < 3 + \frac{1}{4}x \leq 5$

$-5 < \frac{1}{4}x \leq 2$

$-20 < x \leq 8$

$(-20, 8]$

15. $(2x-3)(4x+5) \leq (8x+1)(x-7)$

$8x^2 - 2x - 15 \leq 8x^2 - 55x - 7$

$\frac{53x}{53} \leq \frac{8}{53}$

$x \leq \frac{8}{53}$

$(-\infty, \frac{8}{53}]$

16. $2x(6x+5) < (3x-2)(4x+1)$

$12x^2 + 10x < 12x^2 - 5x - 2$

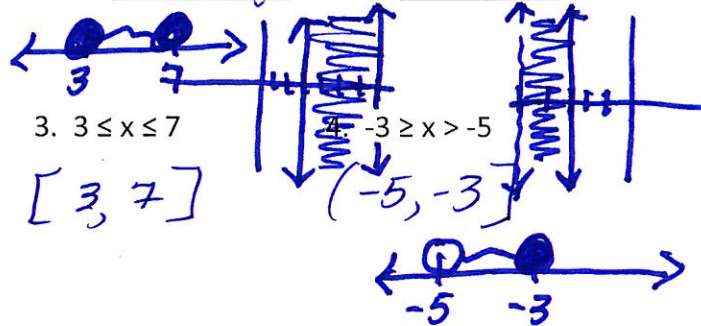
$\frac{15x}{15} < \frac{-2}{15}$

$x < -\frac{2}{15}$

$(-\infty, -\frac{2}{15})$

Name: Key

Date: _____ Period: _____



Solve the inequality, and express the solutions in terms of intervals whenever possible.

1. $|x| < 3$

$x < 3$ & $x > -3$

$(-3, 3)$

2. $|x| \leq 7$

$x \leq 7$ & $x \geq -7$

$[-7, 7]$

3. $|x| \geq 5$

$x \geq 5$ or $x \leq -5$

$(-\infty, -5] \cup [5, \infty)$

4. $|-x| > 2$

$x > 2$ or $x < -2$

$(-\infty, -2) \cup (2, \infty)$

5. $|x+3| < 0.01$

$x+3 < 0.01$ & $x+3 > -0.01$

$x < -2.99$ & $x > -3.01$

$(-3.01, -2.99)$

6. $|x+2| + 0.1 \geq 0.2$

$|x+2| \geq .1$

$x+2 \geq .1$ or $x+2 \leq -.1$

$x \geq -1.9$ or $x \leq -2.1$

$(-\infty, -2.1] \cup [-1.9, \infty)$

7. $|2x+5| < 4$

$2x+5 < 4$ & $2x+5 > -4$

$\frac{2x}{2} < \frac{-1}{2}$ & $\frac{2x}{2} > \frac{-9}{2}$

$x < -\frac{1}{2}$ & $x > -\frac{9}{2}$

$(-\frac{9}{2}, -\frac{1}{2})$

8. $\frac{-1}{3}|6-5x| + 2 \geq 1$

$-\frac{1}{3}|6-5x| \geq -1$

$|6-5x| \leq 3$

$6-5x \leq 3$ & $6-5x \geq -3$

$-5x \leq -3$ & $-5x \geq -9$

$x \geq \frac{3}{5}$ & $x \leq \frac{9}{5}$

Solve.

$[\frac{3}{5}, \frac{9}{5}]$

9. $|7x+2| > -2$

$7x+2 > -2$ or $7x+2 < 2$

$7x > -4$ & $7x < 0$

$x > -\frac{4}{7}$ or $x < 0$

$(-\infty, 0)$

10. $|3x-9| > 0$

$3x-9 > 0$ or $3x-9 < 0$

$3x > 9$ or $3x < 9$

$x > 3$ or $x < 3$

$(-\infty, 3) \cup (3, \infty)$

11. (a) $|x+5| = 3$

$x+5 = 3$ or $x+5 = -3$

$x = -2$ or $x = -8$

(b) $|x+5| < 3$

$x+5 < 3$ & $x+5 > -3$

$x < -2$ & $x > -8$

$-8 < x < -2$ or $(-8, -2)$

(c) $|x+5| > 3$

$x+5 > 3$ or $x+5 < -3$

$x > -2$ or $x < -8$

$(-\infty, -8) \cup (-2, \infty)$

12. (a) $|x-3| < 2$

$x-3 < 2$ & $x-3 > -2$

$x < 5$ & $x > 1$

$1 < x < 5$ or $(1, 5)$

(b) $|x-3| = 2$

$x-3 = 2$ or $x-3 = -2$

$x = 5$ or $x = 1$

(c) $|x-3| > 2$

$x-3 > 2$ or $x-3 < -2$

$x > 5$ or $x < 1$

$(-\infty, 1) \cup (5, \infty)$

13. A person's height will typically decrease by 0.024 inch each year after age 30.

(a) If a woman was 5 feet 9 inches tall at age 30, predict her height at age 70.

$5'9" = 69"$ $40 * .024 \approx .96 \approx 1 \text{ in.}$ $\therefore 5'8"$

(b) A 50-year old man is 5 feet 6 inches tall. Determine an inequality for the range of heights (in inches) that this man will experience between the ages of 30 and 70.

$5'6" = 66"$ $20 * .024 = .48 \text{ in}$

$66 - .48 \leq h \leq 66 + .48$

$(65.52 \leq h \leq 66.48)$