

A.REI.D.11: Absolute Value Inequalities 1b

- 1 The solution set of the inequality $|x - 3| < 5$ is
- 2 The solution set of $|x - 3| > 5$ is
- 3 What is the solution of the inequality $|x + 3| \leq 5$?
- 4 What is the solution of the inequality $|y + 8| > 3$?
- 5 The solution of $|2x - 3| < 5$ is
- 6 What is the solution of the inequality $|2x - 5| < 1$?
- 7 What is the solution set of the inequality $|3x + 6| \leq 30$?
- 8 What is the solution set of the inequality $|2x - 1| < 9$?
- 9 Which represents the solution set for x in the inequality $|2x - 1| < 7$?
- 10 The solution set of $|x - 2| < 3$ is
- 11 What is the solution set of $|4x + 8| > 16$?
- 12 Which is the solution set for $|x - 1| < 5$?
- 13 What is the solution set of the inequality $|3 - 2x| \geq 4$?
- 14 Which equation states that the temperature, t , in a room is less than 3° from 68° ?
 - 1) $|3 - t| < 68$
 - 2) $|3 + t| < 68$
 - 3) $|68 - t| < 3$
 - 4) $|68 + t| < 3$
- 15 The solution set of $|3x + 2| < 1$ contains
 - 1) only negative real numbers
 - 2) only positive real numbers
 - 3) both positive and negative real numbers
 - 4) no real numbers
- 16 If $|2x + 3| < 1$, then the solution set contains
 - 1) only negative real numbers
 - 2) only positive real numbers
 - 3) both positive and negative real numbers
 - 4) no real numbers

- 17 Which value of a does not satisfy the inequality $|a| > 2a - 3$?
- 1) -1
 - 2) 0
 - 3) 3
 - 4) -5
- 18 The inequality $-3 < x < 7$ is the solution of
- 1) $|x - 2| > 5$
 - 2) $|x - 2| < 5$
 - 3) $|x + 2| > 5$
 - 4) $|x + 2| < 5$
- 19 What is the solution of the inequality $|2x - 5| \leq 11$?
- 20 Solve $|2x - 3| > 5$ algebraically.
- 21 Solve $|-4x + 5| < 13$ algebraically for x .
- 22 Solve algebraically for c : $\left| \frac{3}{2}c - 10 \right| - 9 \leq -1$
- 23 Solve algebraically for x : $|3x - 5| - x < 17$
- 24 The inequality $|1.5C - 24| \leq 30$ represents the range of monthly average temperatures, C , in degrees Celsius, for Toledo, Ohio. Solve for C .
- 25 A depth finder shows that the water in a certain place is 620 feet deep. The difference between d , the actual depth of the water, and the reading is $|d - 620|$ and must be less than or equal to $0.05d$. Find the minimum and maximum values of d , to the nearest tenth of a foot.
- 26 The heights, h , of the students in the chorus at Central Middle School satisfy the inequality $\left| \frac{h - 57.5}{2} \right| \leq 3.25$, when h is measured in inches. Determine the interval in which these heights lie and express your answer to the nearest tenth of a foot. [Only an algebraic solution can receive full credit.]

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Answer Section

1 ANS:

$$\{x < 8 \text{ and } x > -2\}$$

REF: 019719siii

2 ANS:

$$\{x > 8 \text{ or } x < -2\}$$

REF: 019823siii

3 ANS:

$$-8 \leq x \leq 2$$

$$x + 3 \leq 5 \quad \text{and} \quad x + 3 \geq -5$$

$$x \leq 2 \quad \text{and} \quad x \geq -8$$

REF: 080203b

4 ANS:

$$y > -5 \text{ or } y < -11$$

$$y + 8 > 3 \quad \text{or} \quad y + 8 < -3$$

$$y > -5 \quad \text{or} \quad y < -11$$

REF: 010610b

5 ANS:

$$-1 < x < 4$$

$$2x - 3 < 5 \quad \text{and} \quad 2x - 3 > -5$$

$$x < 4 \quad \text{and} \quad x < -1$$

REF: 080509b

6 ANS:

$$2 < x < 3$$

$$2x - 5 < 1 \quad \text{and} \quad 2x - 5 > -1$$

$$2x < 6 \quad \text{and} \quad 2x > 4$$

$$x < 3 \quad \text{and} \quad x > 2$$

REF: 060907b

7 ANS:

$$-12 \leq x \leq 8$$

REF: 069821siii

8 ANS:

$$\{x \mid -4 < x < 5\}$$

$$2x - 1 < 9 \quad \text{and} \quad 2x - 1 > -9$$

$$x < 5 \quad \text{and} \quad x > -4$$

REF: 010710b

9 ANS:
 $\{x | -3 < x < 4\}$

REF: 068024siii

10 ANS:
 $\{x | -1 < x < 5\}$

REF: 068718siii

11 ANS:
 $\{x | x < -6 \text{ or } x > 2\}$

REF: 010423siii

12 ANS:
 $\{x | -4 < x < 6\}$

REF: 018921siii

13 ANS:
 $\left\{x \mid x \leq -\frac{1}{2} \text{ or } x \geq \frac{7}{2}\right\}$
 $3 - 2x \geq 4 \quad 3 - 2x \leq -4$
 $-2x \geq 1 \quad \text{or} \quad -2x \leq -7$
 $x \leq -\frac{1}{2} \quad x \geq \frac{7}{2}$

REF: 060318b

14 ANS: 3 REF: 060107b

15 ANS: 1
 $3x + 2 < 1$
 $x < -\frac{1}{3}$ and $3x + 2 > -1$
 $x > -1$

REF: 080102b

16 ANS: 1 REF: 019926siii

17 ANS: 3
 $a > 2a - 3 \quad a < -2a + 3$
 $2a - 3 < a \quad \text{or} \quad 3a < 3$
 $a < 3 \quad a < 1$

REF: 060808b

18 ANS: 2 REF: 069426siii

19 ANS:

$$2x - 5 \leq 11 \quad 2x - 5 \geq -11$$

$$-3 \leq x \leq 8. \quad 2x \leq 16 \text{ and } 2x \geq -6$$

$$x \leq 8 \quad x \geq -3$$

REF: 010925b

20 ANS:

$$2x - 3 > 5 \text{ or } 2x - 3 < -5$$

$$2x > 8 \quad 2x < -2$$

$$x > 4 \quad x < -1$$

REF: 061430a2

21 ANS:

$$-4x + 5 < 13 \quad -4x + 5 > -13 \quad -2 < x < 4.5$$

$$-4x < 8 \quad -4x > -18$$

$$x > -2 \quad x < 4.5$$

REF: 011432a2

22 ANS:

$$\left| \frac{3}{2}c - 10 \right| \leq 8 \quad \frac{3}{2}c - 10 \leq 8 \text{ and } \frac{3}{2}c - 10 \geq -8$$

$$\frac{3}{2}c \leq 18 \quad \frac{3}{2}c \geq 2$$

$$c \leq 12 \quad c \geq \frac{4}{3}$$

REF: 061637a2

23 ANS:

$$|3x - 5| < x + 17 \quad 3x - 5 < x + 17 \text{ and } 3x - 5 > -x - 17 \quad -3 < x < 11$$

$$2x < 22 \quad 4x > -12$$

$$x < 11 \quad x > -3$$

REF: 081538a2

24 ANS:

$$-4 \leq C \leq 36. \quad 15C - 24 \leq 30 \text{ and } 15C - 24 \geq -30$$

$$C \leq 36 \quad C \geq -4$$

REF: 010326b

25 ANS:

$$d - 620 \leq 0.05d \quad d - 620 \geq -0.05d$$

$$590.5, 652.6. \quad .95d \leq 620 \quad \text{and} \quad 1.05d \geq 620$$

$$d \leq 652.6 \quad d \geq 590.5$$

REF: 080427b

26 ANS:

$$\frac{h-57.5}{2} \leq 3.25 \quad \frac{h-57.5}{2} \geq -3.25$$

4.3-5.3. $h - 57.5 \leq 6.5$ and $h - 57.5 \geq -6.5$. To convert from feet to inches, divide the answers by 12:

$$h \leq 64 \quad h \geq 51$$

$$h \leq 5.3 \text{ and } h \geq 4.3$$

REF: 010531b