Name _____

[07-09-24-T10]]

More practice Ineq and Absolute Value

■ A. Write an equation or an inequality for each of the following.

[1] A number x is exactly 3 units away from 5.

[2] A number x is within 2 units of 7.

[3] A number x is more than 2 away from 7.

[4] A number x is at least 5 units away from 2.

[5] A number x is no more than 4 units away from 9.

[6] A number x is no more than 3 units away from -3.

[7] A number x is exactly 12 units away from -1.

■ B. Solve the following. Answer using interval notation. Answer in interval notation using the simplest interval; e.g. simplify $x \in (-\infty, 7) \bigcap (3, 12)$ to $x \in (3, 7)$.

[1] $-2x > 3$

[2] $7 \le -2x + 5 < 12$

[3] $3(x + 7) \le 3x < 9x$

[4] $\frac{5x+3}{2} \le \frac{3x-5}{3} \le 4x$

[5] $3x + 7 \le 2x < 12$

[6] $-7 \le -5x \le 15$

[7] $-7x \le -5x \vee 12 > 3x$

[8] $3x - 4 < -5x + 6 \vee 12x - 3 < x + 7$

[9] $x \le 5 \wedge 3x \ge 15$

[10] $x < 5 \wedge 3x \ge 15$

■ **C. Solve the following. Answer using interval notation. Answer in interval notation using the simplest interval; e.g. simplify $x \in (-\infty, 7) \bigcap (3, 12)$ to $x \in (3, 7)$.**

[1] $-2x + |5| > 4$

[2] $|-7| \leq -2x + 1 < |-11|$

[3] $|3|(x-2) \leq 3x < 9x$

[4] $\frac{5x+3}{2} \leq \frac{3x-5}{3} \leq 4x$

■ **D. Solve the following. Answer using interval notation. Answer in interval notation using the simplest interval; e.g. simplify $x \in (-\infty, 7) \bigcap (3, 12)$ to $x \in (3, 7)$.**

[1] $|-3x + 7| > 4$

[2] $|-5x + 3| < -100$

[3] $|3(2x-1)| \geq x - 7$

[4] $\frac{|5x+3|}{|2|} \leq \frac{4x}{|-3|}$

[5] $|2x - 8| = 9$

[6] $|-x + 3| \leq 10$

[7] $|3x - 2| \geq -1$

[8] $-6 < |2x - 8| < 2$

[9] $-1 \leq |x + 3| < 1$

[10] $|x + 3| > 5$

Answers

■ A.

[1] $|x-5|=3$

[2] $|x-7|<2$

[3] $|x-7|>2$

[4] $|x-2|\geq 5$

[5] $|x-9|\leq 4$

[6] $|x+3|\leq 3$

[7] $|x+1|=12$

■ B.

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

[2] $(-\frac{7}{2}, -1]$

[3] $\emptyset$

[4] $\emptyset$

[5] $(-\infty, -7]$

[6] $[-3, \frac{7}{5}]$

[7] $(-\infty, \infty+)$

[8] $(\infty, \frac{5}{4})$

[9] $[5, 5]$

[10] $\emptyset$

■ C.

[1] $(-\infty, \frac{1}{2})$

[2] $(-5, -3]$

[3] $(0, \infty+)$

[4] $\emptyset$

■ **D.**

[1] $(-\infty, 1) \bigcup (\frac{11}{3}, \infty +)$

[2] ϕ

[3] $(-\infty, \infty +)$

[4] ϕ

[5] $x \in \{-\frac{1}{2}, \frac{17}{2}\}$

[6] $[-7, 13]$

[7] $(-\infty, \infty +)$

[8] $(3, 5)$

[9] $(-4, -2)$

[10] $(-\infty, -8) \bigcup (2, \infty +)$