

Chapter 6
Solving Equations
and
Inequalities

Equations & Inequalities PRACTICE TEST Name: Answer Key

Multiple Choice
 Identify the choice that best completes the statement or answers the question.

1. Solve: $5 = -2x + 11$	a. 8	b. -8	<input checked="" type="radio"/> c. 3	d. -3	① $5 = -2x + 11$ $-6 = -2x$ $\frac{-6}{-2} = \frac{-2x}{-2}$
2. Solve: $8 = 5 + \frac{x}{3}$	a. -7	b. 19	c. 0	<input checked="" type="radio"/> d. 9	$3 = x$ ② $8 = 5 + \frac{x}{3}$ $24 = 15 + x$
3. Solve: $\frac{x}{7} - 3 = 5$	a. 38	<input checked="" type="radio"/> b. 56	c. 26	d. 1	$9 = x$ ③ $\frac{x}{7} - 3 = 5$ $x - 21 = 35$ $x = 56$
4. Solve: $4(x+5) = 16$	a. 7	b. $\frac{11}{4}$	<input checked="" type="radio"/> c. -1	d. -8	④ $4(x+5) = 16$ $4x + 20 = 16 - 20$ $4x = -4$ $\frac{4x}{4} = \frac{-4}{4}$ $x = -1$
5. Solve: $8y = 2y - 12$	<input checked="" type="radio"/> a. $y = -2$	b. $y = -18$	c. $y = \frac{-10}{8}$	d. $y = 2$	
6. Solve: $4v - 6 = -14$	a. $v = \frac{1}{2}$	<input checked="" type="radio"/> b. $v = 2$	c. $v = -2$	d. $v = -2$	
7. A number times 5, minus 6, is 8. Write an equation to determine the number.	a. $6 - 5x = 8$	<input checked="" type="radio"/> b. $5x - 6 = 8$	c. $5 - 6x = 8$	d. $6x - 5 = 8$	

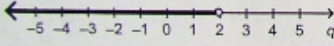
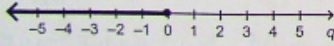
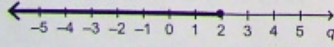
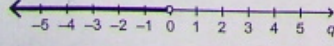
a. 7 b. $\frac{11}{4}$ c. -1 d. -8

5. Solve: $8y = 2y - 12$
 a. $y = -2$ b. $y = -18$ c. $y = \frac{-10}{8}$ d. $y = 2$

6. Solve: $4y - 6 = -14$
 a. $y = \frac{1}{2}$ ~~b. $y = 2$~~ c. $y = -2$ d. $y = -2$

7. A number times 5, minus 6, is 8. Write an equation to determine the number.
 a. $6 - 5x = 8$ b. $5x - 6 = 8$ c. $5 - 6x = 8$ d. $6x - 5 = 8$

8. Use a symbol to write an inequality that corresponds to this statement: x is less than or equal to 4.
 a. $x \geq 4$ b. $x > 4$ c. $x < 4$ d. $x \leq 4$

9. Which of these graphs represent the solution of the inequality $q - 2 \leq 0$?
 a) 
 b) 
 c) 
 d) 

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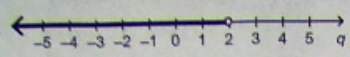
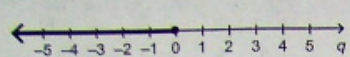
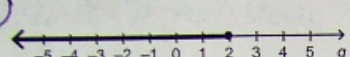
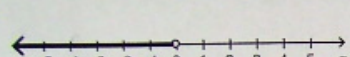
③ $\frac{x}{7} - 3 = 5$
 $\frac{x}{7} - 3 + 3 = 5 + 3$
 $\frac{x}{7} = 8$
 $\frac{x}{7} \cdot 7 = 8 \cdot 7$
 $x = 56$

④ $4(x + 5) = 16$
 $4x + 20 = 16$
 $4x + 20 - 20 = 16 - 20$
 $4x = -4$
 $\frac{4x}{4} = \frac{-4}{4}$
 $x = -1$

⑤ $8y = 2y - 12$
 $8y - 2y = 2y - 12 - 2y$
 $6y = -12$
 $\frac{6y}{6} = \frac{-12}{6}$
 $y = -2$

⑥ $4y - 6 = -14$
 $4y - 6 + 6 = -14 + 6$
 $4y = -8$
 $\frac{4y}{4} = \frac{-8}{4}$
 $y = -2$

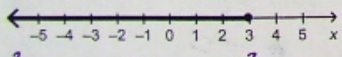
9. Which of these graphs represent the solution of the inequality $q - 2 \leq 0$?

- a) 
- b) 
- c) 
- d) 

$q - 2 \leq 0$
 $q \leq 2$
 $8y = 2y + 12$
 $6y = \frac{-12}{6}$
 $y = -2$
 $4y - 6 = -14$
 $4y = \frac{-8}{4}$
 $y = -2$

10. Which inequality has its solution graphed on the number line below?

- a) $2 + 3x \geq 11$
- b) $3 - 3x \geq 12$
- c) $5 - 3x \leq 14$
- d) $5 + 3x \leq 14$



a) $2 + 3x \geq 11$
 $3x \geq 9$
 $\frac{3x}{3} \geq \frac{9}{3}$
 $x \geq 3$

b) $3 - 3x \geq 12$
 $-3x \geq 9$
 $\frac{-3x}{-3} \geq \frac{9}{-3}$
 $x \leq -3$

c) $5 - 3x \leq 14$
 $-3x \leq 9$
 $\frac{-3x}{-3} \leq \frac{9}{-3}$
 $x \geq -3$

d) $5 + 3x \leq 14$
 $3x \leq 9$
 $\frac{3x}{3} \leq \frac{9}{3}$
 $x \leq 3$
 *

Short Answer. Remember to SHOW YOUR WORK for all questions in this section!

1. Solve the following equations:

$$\begin{aligned} \text{a) } 9n + 4 &= 67 \\ \frac{9n}{9} &= \frac{63}{9} \\ n &= 7 \end{aligned}$$

$$\begin{aligned} \text{b) } 8x - 2 &= 5x + 10 \\ 3x - 2 &= 10 \\ \frac{3x}{3} &= \frac{12}{3} \\ x &= 4 \end{aligned}$$

$$\begin{aligned} \text{c) } -3(x + 4) &= 24 \\ -3x - 12 &= 24 \\ \frac{-3x}{-3} &= \frac{36}{-3} \\ x &= -12 \end{aligned}$$

$$\begin{aligned} \text{d) } \frac{1}{5} + \frac{7}{6} &= \frac{6}{5} \\ 6x + 35 &= 36 \\ \frac{6x}{6} &= \frac{1}{6} \\ x &= \frac{1}{6} \end{aligned}$$

$$\begin{aligned} \text{e) } \frac{2}{3}(2x - 1) &= \frac{3}{2}(x - 3) \\ 2(2x - 1) &= 9(x - 3) \\ 4x - 2 &= 9x - 27 \\ -5x - 2 &= -27 \\ \frac{-5x}{-5} &= \frac{-25}{-5} \\ x &= 5 \end{aligned}$$

2. A student solved this equation: $3x + 5 = 18$

$$\begin{aligned} 3x + 5 &= 18 \\ \frac{3x}{3} + 5 &= \frac{18}{3} \\ x + 5 &= 6 \\ x + 5 - 5 &= 6 - 5 \\ x &= 1 \end{aligned}$$

subtract 5 first

a) Circle the errors the student made.

b) Solve the equation in the space provided:

$$\begin{aligned} 3x + 5 &= 18 - 5 \\ 3x &= 13 \\ \frac{3x}{3} &= \frac{13}{3} \\ x &= \frac{13}{3} \end{aligned}$$

3. State "yes" or "no" to indicate if you would reverse the inequality sign to solve each inequality.

- a) $6 < -x$ yes (You would have to divide by "-1".)
 b) $2x \geq -4$ no " " " " divide by 2
 c) $\frac{x}{-4} < -5$ yes " " " " multiply by -4
 d) $\frac{-x}{3} > 9$ yes First you would multiply by three, but then you would have to divide by -1.

4. Define a variable and write an inequality to describe the situation.

- a) You must be **under 12** years old to play for the Mini Tommies. $x < 12$
 b) Student Council must sell **at least 45** t-shirts to make a profit. $x \geq 45$

5. Graph the solution on a number line.

