# **Unit 1 - Review (Equations and Inequalities)**

### Multiple Choice

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

What is the solution of the following one-step equation?

1. x - 0.7 = -2

- a. -1.3
- b. -0.4
- c. 0.77
- d. -0.77

Solve the equation.

2. 3v + 20 = 3 + 2v

- a.  $-\frac{1}{17}$  b.  $7\frac{2}{3}$
- c. 23
- d. -17

3. 0.125r - 0.0625 + 0.25r = 0.25 + r

- a. -0.28 b. 0.23
- c. -0.5
- d. -0.3

4. -5y - 9 = -(y - 1)

- a.  $-\frac{1}{2}$  b.  $-2\frac{1}{2}$
- c. -2
- d.  $-\frac{2}{5}$

Use an algebraic equation to solve the problem.

- 5. A rectangle is 3 times as long as it is wide. The perimeter is 60 cm. Find the dimensions of the rectangle. Round to the nearest tenth if necessary.
  - a. 7.5 cm by 22.5 cm

c. 20 cm by 60 cm

b. 7.5 cm by 52.5 cm

- d. 15 cm by 22.5 cm
- 6. The sides of a triangle are in the ratio 3:4:5. What is the length of each side if the perimeter of the triangle is 90 cm?
  - a. 10.5 cm, 11.5 cm, and 12.5 cm
- c. 7.5 cm, 11.5 cm, and 32.1 cm
- 22.5 cm, 30 cm, and 37.5 cm
- d. 19.3 cm, 25.7 cm, and 32.1 cm
- 7. Two cars leave Denver at the same time and travel in opposite directions. One car travels 10 mi/h faster than the other car. The cars are 300 mi apart in 3 h. How fast is each car traveling?
  - a. 35 mi/h and 45 mi/h

c. 45 mi/h and 55 mi/h

b. 55 mi/h and 35 mi/h

d. 55 mi/h and 65 mi/h

Name:

ID: A

#### Is the following always, sometimes, or never true?

8. 14 + 3x - 7 = 7x + 7 - 4x

a. always

- sometimes
- c. never

9. 8 + 6x - 10 = 10x + 11 - 4x

a. always

- b. sometimes
- c. never

Solve the equation or formula for the indicated variable.

\_\_\_\_ 10.  $S = 5r^2t$ , for t

- a.  $t = \frac{S}{5} r$  b.  $t = \frac{25r}{S}$  c.  $t = r^2 5S$  d.  $t = \frac{S}{5r^2}$

\_\_\_\_ 11.  $T = \frac{4U}{E}$ , for U

- a.  $U = \frac{T E}{4}$  b.  $U = T + \frac{E}{4}$  c. U = 4T E d.  $U = \frac{TE}{4}$

#### What inequality represents the sentence?

- 12. 14 fewer than a number is at least -8
  - a.  $x + 14 \le -8$

c.  $14 - x \ge -8$ 

b.  $x - 14 \ge -8$ 

- d. x 14 < -8
- 13. The product of a number and 12 is no more than 15.
  - 12n < 15

c.  $12n \ge 15$ 

12n > 15

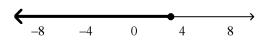
d.  $12n \le 15$ 

Solve the inequality. Graph the solution set.

- 14.  $2 + 2k \le 8$ 
  - a.  $k \ge 3$



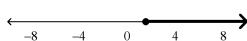
c.  $k \le 3$ 



- b.  $k \le 5$ 
  - 0 -4
- d.  $k \ge 5$

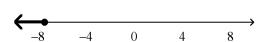
 $15. 2r - 9 \ge -6$ 

- a.  $r \le 1\frac{1}{2}$ 
  - <del>-8 -4 0 4 8</del>
- c.  $r \ge 1\frac{1}{2}$



- b.  $r \ge -7\frac{1}{2}$ 
  - **←**-8 −4 0 4 8



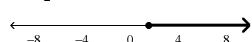


 $16. \quad 26 + 6b \ge 2(3b + 4)$ 

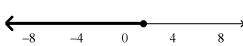
a. all real numbers



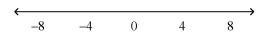
c.  $b \ge 1\frac{1}{2}$ 



b.  $b \le 1\frac{1}{2}$ 



d. no solutions



Solve the problem by writing an inequality.

\_\_\_\_ 17. A club decides to sell T-shirts for \$15 as a fund-raiser. It costs \$20 plus \$9 per T-shirt to make the T-shirts. Write and solve an equation to find how many T-shirts the club needs to make and sell in order to profit at least \$150.

- a.  $15x (9x + 20) \ge 150$ ;  $x \ge 28.33$
- c.  $(8x + 20) 15x \ge 150$ ;  $x \ge 20$
- b.  $15x 9x + 20 \ge 150$ ;  $x \ge 20$
- d.  $15x 9(x + 20) \ge 150$ ;  $x \ge 20$

18. If the perimeter of a rectangular picture frame must be less than 200 in., and the width is 36 in., what must the height *h* of the frame be?

- a. h < 64 in.
- b. h > 128 in.
- c. h > 64 in.
- d. h < 128 in.

Is the inequality sometimes, always, or never true?

- 19. -2(2x+9) > -4x+9
  - a. always

- b. sometimes
- c. never

Name:

 $20. 2(10x-5)-9x \le 11x+13$ 

a. always

- sometimes b.
- c. never

Solve the compound inequality. Write your solution in interval notation.

21. 4x - 5 < -17 or 5x + 6 > 31

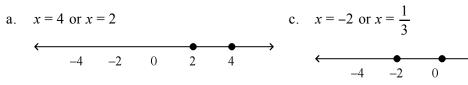
- a. x < -3 or x > 5  $-8 \quad -4 \quad 0 \quad 4 \quad 8$ c.  $x < -3 \text{ or } x > 7\frac{2}{5}$   $-8 \quad -4 \quad 0 \quad 4 \quad 8$
- b.  $x < -5\frac{1}{2}$  or  $x > 7\frac{2}{5}$  d.  $x < -5\frac{1}{2}$  or x > 5

22.  $-2 \le 2x - 4 < 4$ 

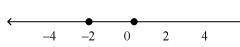
- a.  $0 \le x < -2$
- b.  $1 \le x < 4$

Solve the absolute value equation. Graph the solution.

|x-3| = 1



c. x = -2 or  $x = \frac{1}{3}$ 



- b. x = -2 or x = 2
- d. x = -2 or x = 4

- $24. \ 2|4x-5|-2=-4$ 
  - a.  $x = \frac{3}{8}$  or x = 1

c.  $x = \frac{3}{8}$  or  $x = 1\frac{1}{2}$ 



b. x = 1 or  $x = 1\frac{1}{2}$ 

d.  $x = \frac{3}{8}$  or  $x = 1\frac{3}{8}$ 



Name:

25. |4x + 1| = -3

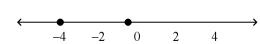
a. 
$$x = -\frac{1}{2}$$
 or  $x = \frac{1}{2}$ 

c. 
$$x = -1$$
 or  $x = \frac{1}{2}$ 



b. 
$$x = -\frac{1}{2}$$
 or  $x = -1$ 

d. 
$$x = -\frac{1}{2}$$
 or  $x = -4$ 



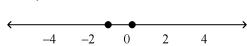
 $26. \ 4|3x+5|+2=10$ 

a. 
$$x = \frac{1}{4}$$
 or  $x = -2\frac{1}{3}$ 

c. 
$$x = \frac{1}{4}$$
 or  $x = -1\frac{5}{12}$ 



b. 
$$x = \frac{1}{4}$$
 or  $x = -1$ 



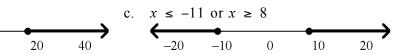
d. 
$$x = -1$$
 or  $x = -2\frac{1}{3}$ 

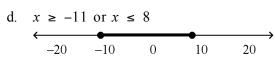


Solve the inequality. Graph the solution.

 $27. |2x + 3| \ge 19$ 

a. 
$$x \le -22 \text{ or } x \ge 16$$





28.  $|2x + 10| \le 26$ 

a. 
$$-18 \ge x \ge 8$$
 $-20$   $-10$  0 10 20

c. 
$$-36 \le x \le 16$$
 $-40$   $-20$  0 20 40

29. |4x + 8| > 28

a. 
$$x < -36 \text{ or } x > 20$$

c. 
$$x < -9 \text{ or } x > 5$$

d. 
$$x < -5 \text{ or } x > 5$$

30. A furniture maker uses the specification  $21.88 \le w \le 22.12$  for the width w in inches of a desk drawer. Write the specification as an absolute value inequality.

a. 
$$|w - 0.24| \le 22.12$$

c. 
$$|w - 22| \le 0.24$$

b. 
$$|w - 0.12| \le 22$$

d. 
$$|w - 22| \le 0.12$$

31. When Spheres-R-Us ships bags of golf balls, the number of balls in each bag must be within 6 balls of 300. Write a compound inequality and an absolute value inequality for an acceptable number of golf balls b in each bag.

a. 
$$294 \le b \le 306$$
;  $|b - 6| \le 300$ 

c. 
$$297 \le b \le 303$$
;  $|b - 300| \le 6$ 

a. 
$$294 \le b \le 306$$
;  $|b-6| \le 300$  c.  $297 \le b \le 303$ ;  $|b-300| \le 6$  b.  $297 \le b \le 303$ ;  $|b-300| \le 6$  d.  $294 \le b \le 306$ ;  $|b-300| \le 6$ 

d. 
$$294 \le b \le 306; |b - 300| \le 6$$

**Short Answer** 

Solve the compound inequality. Write your solution in interval notation.

32.  $5x + 10 \ge 10$  and  $7x - 7 \le 14$ 

Solve the inequality. Graph the solution.

33. 
$$2 \left| x + \frac{1}{4} \right| < 9$$

# **Unit 1 - Review (Equations and Inequalities) Answer Section**

## MULTIPLE CHOICE

1.		PTS: 1		REF: 1-4 Solving Equations						
		<ul><li>-4.1 To solve equations quation   solution of an equatio</li></ul>		2 Solving a Multi-Step Equation						
2		PTS: 1	_	REF: 1-4 Solving Equations						
۷.	ORI: 1.	-4.1 To solve equations	TOP: 1-4 Problem	2 Solving a Multi-Step Equation						
		quation   solution of an equation								
3	ANS: C		DIF: L3							
٥.				2 Solving a Multi-Step Equation						
		quation   solution of an equatio								
4.			DIF: L2							
	OBJ: 1-			2 Solving a Multi-Step Equation						
	KEY: ed	quation   solution of an equatio	n   inverse operations	DOK: DOK 1						
5.	ANS: A		DIF: L3	REF: 1-4 Solving Equations						
		1: 1-4.2 To solve problems by writing equations								
		-4 Problem 3 Using an Equatio	on to Solve a Problem	KEY: equation   solution of an equation						
	DOK: D									
6.	ANS: B		211. 20	REF: 1-4 Solving Equations						
		-4.2 To solve problems by writ								
		-4 Problem 3 Using an Equatio	on to Solve a Problem	KEY: equation   solution of an equation						
7	DOK: D ANS: C		DIF: L3	DEE: 1 4 Solving Equations						
7.		-4.2 To solve problems by writ		REF: 1-4 Solving Equations						
		-4 Problem 3 Using an Equation		KEY: equation   solution of an equation						
	DOK: D		in to bolve a 1 loolem	TET. Equation   Solution of an equation						
8.	ANS: A		DIF: L3	REF: 1-4 Solving Equations						
٠.		-4.1 To solve equations	211. 20	TELL I Forthing Equations						
		OP: 1-4 Problem 4 Equations with No Solutions and Identities								
	KEY: ed	quation   identity	DOK: DOK 1							
9.	ANS: C	PTS: 1	DIF: L3	REF: 1-4 Solving Equations						
		-4.1 To solve equations								
		OP: 1-4 Problem 4 Equations with No Solutions and Identities								
	KEY: ec	quation DOK: DOK 1								
10.	ANS: D			REF: 1-4 Solving Equations						
		_	5 Solving a Literal Equation							
1.1		quation   literal equation	DOK: DOK 2	DEE 1401' E 4'						
11.	ANS: D		DIF: L3	REF: 1-4 Solving Equations						
		-4.1 To solve equations quation   literal equation	DOK: DOK 2	5 Solving a Literal Equation						
12	ANS: B	- · · · · · · · · · · · · · · · · · · ·	DIF: L2	REF: 1-5 Solving Inequalities						
14.		-5.1 To solve and graph inequa		KLI. 1-3 Solving inequalities						
		-5 Problem 1 Writing an Inequal								
		ompound inequality   word prob	DOK: DOK 1							

13.	ANS:	D	PTS: 1	[	DIF:	L3	REF:	1-5 Solving Inequalities	
	OBJ:	1-5.1 To solv	e and gra	aph inequaliti	ies				
		1-5 Problem				a Sentence			
		compound ine					DOK:	DOK 1	
14.	ANS:	_	PTS: 1	_	DIF:		REF:	1-5 Solving Inequalities	
		1-5.1 To solv			ies			8 4	
		1-5 Problem 2				nequality	DOK:	DOK 2	
15	ANS:		PTS: 1		DIF:			1-5 Solving Inequalities	
10.							TCLT.	1 5 Solving mediumines	
		1-5.1 To solve and graph inequalities  1-5 Problem 2 Solving and Graphing an Inequality  DOK: DOK 2							
16	ANS:		PTS: 1		DIF:			1-5 Solving Inequalities	
10.		1-5.1 To solv				LJ	KLI.	1-3 botting mequanties	
		1-5 Problem 2				neguality	DOK.	DOK 2	
17	ANS:		PTS: 1		DIF:			1-5 Solving Inequalities	
1 / .		1-5.1 To solv				L3		1-5 Problem 3 Using an Inequality	
		DOK 2	c and gr	apii iiicquaiiti	ics		101.	1-3 1 1001cm 3 Osing an inequality	
1 Q		A	DTC· 1	I	DIF:	Ι 2	DEE:	1-5 Solving Inequalities	
10.		1-5.1 To solv				L3		1-5 Problem 3 Using an Inequality	
		DOK 2	e and gra	apii illequaliti	ies		TOF.	1-3 Froblem 3 Osing an inequality	
10	ANS:		DTC. 1	ı	DIF:	1.2	DEE.	1.5 Calving Inaqualities	
19.		1-5.1 To solv				L3	KEΓ.	1-5 Solving Inequalities	
		1-5.1 10 solv				mbere ac Solut	tion		
		DOK 2	110 501	ution of An I	cai ivu	imocis as solui	1011		
20	ANS:		PTS: 1	1	DIE.	L3	REE.	1-5 Solving Inequalities	
20.						LJ	KLI.	1-3 Solving mequanties	
		<ul><li>1-5.1 To solve and graph inequalities</li><li>1-5 Problem 4 No Solution or All Real Numbers as Solution</li></ul>							
		DOK 2	1 110 501		tour rva	annocis as sola	.1011		
21	ANS:		PTS: 1		DIF:	1.3	RFF.	1-5 Solving Inequalities	
21.		1-5.2 To write					KLI.	1 5 Solving medianties	
		1-5 Problem 6				arrivo	KEY.	compound inequality	
		DOK 2		,				Total Promise and Assessed	
22.	ANS:		PTS: 1	[	DIF:	L3	REF:	1-5 Solving Inequalities	
		1-5.2 To write						8 4	
		1-5 Problem 5			•		KEY:	compound inequality	
		DOK 2			1 3			1 1 2	
23.	ANS:	A	PTS: 1		DIF:	L2			
		1-6 Absolute							
	OBJ:	1-6.1 To write and solve equations and inequalities involving absolute value							
	TOP:	1-6 Problem 1					_	absolute value	
		DOK 1		-		*			
24.	ANS:		PTS: 1		DIF:	L2			
		1-6 Absolute							
		1-6.1 To write and solve equations and inequalities involving absolute value							
		1-6 Problem 2							
		absolute value	_			DOK 1			

25.	ANS:	C PTS: 1 DIF: L3
	REF:	1-6 Absolute Value Equations and Inequalities
	OBJ:	1-6.1 To write and solve equations and inequalities involving absolute value
	TOP:	1-6 Problem 1 Solving an Absolute Value Equation KEY: absolute value
	DOK:	DOK 1
26.	ANS:	D PTS: 1 DIF: L3
	REF:	1-6 Absolute Value Equations and Inequalities
	OBJ:	1-6.1 To write and solve equations and inequalities involving absolute value
	TOP:	1-6 Problem 2 Solving a Multi-Step Absolute Value Equation
	KEY:	absolute value DOK: DOK 1
27.	ANS:	C PTS: 1 DIF: L3
	REF:	1-6 Absolute Value Equations and Inequalities
	OBJ:	1-6.1 To write and solve equations and inequalities involving absolute value
	TOP:	1-6 Problem 5 Solving the Absolute Value Inequality; "greater than"
	KEY:	absolute value DOK: DOK 2
28.	ANS:	B PTS: 1 DIF: L3
	REF:	1-6 Absolute Value Equations and Inequalities
	OBJ:	1-6.1 To write and solve equations and inequalities involving absolute value
	TOP:	1-6 Problem 4 Solving the Absolute Value Inequality; "less than"
	KEY:	absolute value DOK: DOK 2
29.	ANS:	C PTS: 1 DIF: L3
	REF:	1-6 Absolute Value Equations and Inequalities
	OBJ:	1-6.1 To write and solve equations and inequalities involving absolute value
	TOP:	1-6 Problem 5 Solving the Absolute Value Inequality; "greater than"
		absolute value DOK: DOK 2
30.	ANS:	D PTS: 1 DIF: L3
	REF:	1-6 Absolute Value Equations and Inequalities
	OBJ:	1-6.1 To write and solve equations and inequalities involving absolute value
	TOP:	1-6 Problem 6 Using an Absolute Value Inequality KEY: absolute value
	DOK:	DOK 2
31.	ANS:	D PTS: 1 DIF: L3
	REF:	1-6 Absolute Value Equations and Inequalities
	OBJ:	1-6.1 To write and solve equations and inequalities involving absolute value
	TOP:	1-6 Problem 6 Using an Absolute Value Inequality KEY: absolute value
	DOK:	DOK 2
т	NICXXIE	מי
LI A	NSWE	AN.

## **SHOR**

32. ANS:  $x \ge 0$  and  $x \le 3$ 

4 -4 0 -8

PTS: 1 DIF: L3 REF: 1-5 Solving Inequalities

OBJ: 1-5.2 To write and solve compound inequalities

TOP: 1-5 Problem 5 Solving an AND Inequality KEY: compound inequality

DOK: DOK 2

33. ANS:

$$-4\frac{3}{4} < x < 4\frac{1}{4}$$

$$\leftarrow -6 \quad -4 \quad -2 \quad 0 \quad 2 \quad 4 \quad 6$$

PTS: 1 DIF: L4 REF: 1-6 Absolute Value Equations and Inequalities

OBJ: 1-6.1 To write and solve equations and inequalities involving absolute value

TOP: 1-6 Problem 4 Solving the Absolute Value Inequality; "less than"

KEY: absolute value DOK: DOK 2