

Algebra 1 – WH
Midterm Exam
REVIEW
January 2015

Name: _____

Date: _____

Teacher: _____

Period: _____

Your midterm examination will consist of:

- * 30 multiple choice questions – these will be completed on Scantron.
- * 6 free response questions – these will be completed in the test booklet. Show your work.

The exam will include material from Units 1, 2, 3, and 4.

The score you earn will count as 10% of your overall final student grade in Algebra 1 – WH.

The exam is scheduled for _____.

The following pages provide a comprehensive review of the content that will be assessed on this exam. We will not take time in class to work through this material – it is your responsibility to work through these exercises. The answers are provided on pages 9-10. Feel free to stop in on your own time for any assistance. Good luck!

Mr. Norman & Mrs. Glaeser

1. Evaluate:

(a) $ -7 - x $ when $x = 2$	(b) $3y - 6$ when $y = -8$
(c) $x^2 - y$ when $x = 5$ and $y = -3$	(d) $-4x^2 - 2$ when $x = -3$

2. Simplify each expression:

(a) $3 + 6^2 \div 4 + 2$	(b) $\frac{15 - 6 \cdot 2}{8(4^2 - 7)}$
(c) $16 + 3(8 - 3)^2 \div 5 - 1$	(d) $\frac{(6+8)(7+3)}{2+3 \cdot 2^2}$

3. Insert grouping symbols to produce the given values for each:

(a) $14 \div 5 + 2 + 8 = 10$

(b) $8 + 25 \cdot 2 \div 6 = 11$

4. Perform the indicated operation:

(a) $4 - 3[4 - 2(6 - 3)]$	(b) $-((-3)^3 - 35)$
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5. Find the opposite of each number:

(a) 13 _____

(b) -18.2 _____

(c) $|-61|$ _____

6. Simplify:

(a) $|-2| + |-3.4| - |-9| =$ _____

(b) $|-12 + 15| =$ _____

(c) $|-21| - 2|16| =$ _____

(d) $-|-6| + |4| =$ _____

7. Find the reciprocal of each:

(a) $\frac{2}{5}$ _____

(b) $-\frac{5}{8}$ _____

(c) -57 _____

8. SOLVE EACH EQUATION:

a. $-6 = 7c + 5$	b. $y - \frac{1}{2} = \frac{3}{5}$	c. $-3x = 16 + 7x$
d. $-7 = 5 - (7 - 4x)$	e. $\frac{x}{-30} = -2.3$	f. $6x + 12 = -18$
g. $20 = 6 - 7r$	h. $\frac{y}{8} - 6 = 2$	i. $-4(2x - 3) = 12 - 9x$
j. $5(x + 3) = 7x + 10 - 2x + 5$		
k. $5 - 2(2x + 5) + 2x = -5(x + 4) + 3x$		
l. $12y - 4(y - 5) = -4$		

9. Solve and graph each of the following inequalities:

(a) $2x + 5 \leq 5 + 2(x - 9)$

(b) $-6x + 3 > 4x + 23$

(c) $-(4 + x) + 5x \leq 2(2x + 9)$

(d) $-2m + 6 \leq 18$

(e) $|x| + 5 \leq 7$

(f) $|2x + 1| > 7$

(g) $-3|x + 3| \geq 27$

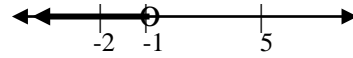
(h) $5 + 2\left|\frac{x}{3}\right| \geq 15$

10. Write an inequality describing each graph below:

(a)



(b)



11. Graph each solution.

(a) $-1 < x < 4$

(b) $x < 3$ or $x > 4$

(c) $0 \leq y < 7.5$

(d) $k < 12$ or $k \geq 3.5$

12. Solve and graph the following compound inequalities.

(a) $-5 \leq x + 2 < 0$

(b) $10y > -2$ or $2 + y \leq -15$

(c) $-4x < 8$ or $-3x \geq 9$

(d) $x + 4 > 2$ and $-2x + 6 \geq 4$

13. Solve the following absolute value equations.

(a) $-7 = |3x + 1| + 8$

(b) $6 - 2|4 - x| = -8$

(c) $-\left|\frac{x}{2}\right| + 5 = -2$

14. List the domain and range of the following: $\{(1, 0), (-3, 8), (2.5, -9), (-6, -4)\}$

Does this relation represent a function? Explain why or why not.

15. Find the domain and range for the following: $\{(1, 2), (-10, 4), (-3, -7), (4, 1), (1, -5)\}$

Does this relation represent a function? Explain why or why not.

16. Given $g(x) = -3x + 7$

a. $g(3) =$ _____

b. $g(-4) =$ _____

c. $g(0) =$ _____

SAMPLE MULTIPLE CHOICE QUESTIONS

1. Solve: $-4x - 6 - 3x = 5$. A. $\frac{-11}{7}$ B. -3 C. $1\frac{6}{11}$ D. 3

3. Which equation is a translation of “3 times a number decreased by 6 equals 18”?

A. $3x \div 6 = 18$

B. $3x - 6 = 18$

C. $6 - 3x = 18$

D. $3x + 6 = 18$

5. Which inverse operation can be used to solve the equation $4 = y - 8$?

- A. Add 8 to each side. B. Subtract 8 from each side. C. multiply both sides by 8.
D. Divide each side by 8.

6. Evaluate: $-6 - (-12) + 8$ A. 26 B. 2 C. -2 D. 14

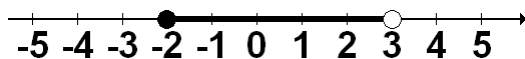
7. Evaluate $5 + x - 3$ if $x = -2$ A. 6 B. -6 C. 0 D. 1

11. Solve the inequality: $2 - x < -5$ A. $x < 7$ B. $x > 7$ C. $x < -7$ D. $x > -7$

12. Solve : $2x - 5 > 3$ or $2 - 3x > 5$

- A. $x < -1$ or $x > 4$ B. $x < 5$ or $x > 3$ C. $x > 4$ or $x > -1$ D. $-1 < x < 4$

13. What compound sentence is graphed below?



- A. $-2 < y < 3$ B. $-2 < y \leq 3$ C. $y \geq -2$ or $y < 3$ D. $-2 \leq y < 3$

FREE RESPONSE QUESTIONS

DIRECTIONS: FOR EACH OF THE FOLLOWING SHOW ALL WORK AND ALL STEPS IN ARRIVING AT AN ANSWER

1. Solve for x: $4 - 2(3x - 4) - 2x = -(x - 6) - (4x + 3)$

2. Solve and graph: $3m - (-6) < 24$ or $-5m + 2 \leq 12$

3. Solve the following $|5x - 1| = 4$. Check for extraneous solutions.

4. A plumber charges a flat rate of \$120 and \$42 per hour for his work.

A) Write an equation to represent the cost c , based on hours of work, h .

B) How much will it cost if the plumber works for 9 hours?

C) If the total cost is \$435, how many hours did the plumber work?

ANSWERS

1. (a) 9 (b) -30 (c) 28 (d) -38	2. (a) 14 (b) $\frac{1}{24} = .041\bar{6}$ (c) 30 (d) 10
3. (a) $14 \div (5+2) + 8 = 10$ (b) $(8+25) \cdot 2 \div 6 = 11$	4. (a) 10 (b) 62

5. (a) -13 (b) 18.2 (c) -61	6. (a) -3.6 (b) 3 (c) -11 (d) -2
7. (a) $\frac{5}{2}$ (b) $-\frac{8}{5}$ (c) $-\frac{1}{57}$	

8. (a) $c = -\frac{11}{7}$ (b) $y = \frac{11}{10}$ (c) $x = -\frac{8}{5}$ (d) $x = -\frac{5}{4}$ (e) $x = 69$ (f) $x = -5$
 (g) $r = -2$ (h) $y = 64$ (i) $x = 0$ (j) all reals (k) \emptyset (l) $y = -3$

9. (a) \emptyset 	(b) $x < -2$
(c) R 	(d) $m \geq -6$
(e) $-2 \leq x \leq 2$ 	(f) $x > 3$ or $x < -4$
(g) \emptyset 	(h) $x \geq 15$ or $x \leq -15$

10. (a) $x \geq -2$ 	(b) $x < -1$
11. (a) 	(b)
(c) 	(d) All Reals

12. (a) $-7 \leq x < -2$ 	(b) $y > -\frac{1}{5}$ or $y \leq -17$
(c) $x > -2$ or $x \leq -3$ 	
(d) $x > -2$ and $x \leq 1$ 	

13.

- (a) \emptyset
 (b) $\{-3, 11\}$
 (c) $\{-14, 14\}$

14. Domain: $\{-6, -3, 1, 2.5\}$ Range: $\{-9, -4, 0, 8\}$ It is a function.15. Domain: $\{-10, -3, 1, 4\}$ Range: $\{-7, -5, 1, 2, 4\}$ It is not a function.

16. a. -2, b. 19, c. 7, d. -13, e. -48, f. -4

MULT. CHOICE

- | | | | |
|-------|------|-------|-------|
| 1. A | | 3. B | |
| 5. A | 6. D | 7. C | |
| | | 11. B | 12. A |
| 13. D | | | |

FREE RESPONSE ANSWERS1. Solve for x: $4 - 2(3x - 4) - 2x = -(x - 6) - (4x + 3)$

$$\begin{array}{r}
 4 - 6x + 8 - 2x = -x + 6 - 4x - 3 \\
 -8x + 12 = -5x + 3 \\
 +8x \qquad \qquad +8x \\
 \hline
 12 = 3x + 3 \\
 -3 \qquad \qquad -3 \\
 \hline
 9 = 3x \\
 3 \qquad \qquad 3 \\
 \hline
 3 = x
 \end{array}$$

2. Solve and graph: $3m - (-6) < 24$ or $-5m + 2 \leq 12$

$$\begin{array}{r}
 3m + 6 < 24 \qquad \text{OR} \qquad -5m + 2 \leq 12 \\
 -6 \qquad -6 \qquad \qquad \qquad -2 \qquad -2 \\
 \hline
 3m < 18 \qquad \qquad \qquad -5m \leq 10 \\
 3 \qquad 3 \qquad \qquad \qquad -5 \qquad -5 \\
 \hline
 m < 6 \quad \text{OR} \quad m \geq -2
 \end{array}$$


ALL REAL NUMBERS

3. Solve. $|5x - 1| = 4$

$$\begin{array}{l}
 5x - 1 = 4 \\
 5x = 5 \\
 x = 1
 \end{array}$$

$$\begin{array}{l}
 5x - 1 = -4 \\
 5x = -3 \\
 x = -\frac{3}{5}
 \end{array}$$

Both Solutions Work