Name:_____ Per:_____

Algebra Integration Semester ***Practice*** Final 2016-17

Please note:

- Absolutely no cell phones out during the test.
- You may borrow a calculator from the teacher, but you may not use a calculator another student is using for the test.
- All work must be shown for each problem to receive full credit.
- Round all answers to the nearest hundredth (0.01)

Important Equations from the first semester:

Linear Equations

Slope Intercept Form: $y = mx + b$

m is the slope & b is the y-intercept

Standard Form: $Ax+By=C$

Slope formula : $$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Unit 1: Linear Equations

Solve Equations	**Score (out of 10):**

Questions **Answers:**

1. $16 = -8 - x$

   a. $x = -8$ b. $x = 8$

   c. $x = 24$ d. $x = -24$

   1. Circle one: a b c d

2. $\frac{1}{4}x = 13$

   2. _____

3. $5x + 2 = 8x + 16$

   3. _____

4. $\frac{2}{5}x = \frac{1}{17}$

   4. _____

5. $32 = x + 3(x - 2)$

   5. _____

6. Stan's solution to an equation is shown below:

   ➔ Given: $n + 3(n + 10) = 90$
   ➔ Step 1: $n + 3n + 10 = 90$
   ➔ Step 2: $4n + 10 = 90 - 10$
   ➔ Step 3: $4n = 90 - 10$
   ➔ Step 4: $4n = 80$
   ➔ Step 5: $\frac{4n}{4} = \frac{80}{4}$
   ➔ Step 6: $n = 20$

   6. Circle one: a b c d

Which statement about Stan's solution is true?

A Stan's solution is correct.	**B** Stan made a mistake in Step 1.
C Stan made a mistake in Step 3.	**D** Stand made a mistake in Step 5.

7. Solve for x: $\frac{8}{6} = \frac{x}{10}$

7. _____

8. Which equation is equivalent to $2x - 3(6x + 2) = 13x$?

   A $-16x + 6 = 13x$ **B** $-16x + 2 = 13x$

   C $-16x = 13x + 6$ **D** $13x - 6 = -16x$

8. Circle one: a b c d

Percent Word Problems	**Score (out of 10):**

Solve for x:

9. Which of the following equations is NOT a correct method to find the answer to: **7 is 30% of what number?**

   A $7 = \frac{30}{100}x$ **B** $\frac{30}{100} = \frac{x}{7}$

   C $\frac{30}{100} = \frac{7}{x}$ **D** $0.3x = 7$

9. Circle one: a b c d

10. 45% of people in Oregon have blood type O blood. Out of 9000 people, how many would you expect to have type O blood?

10. _____

11. 15 is what percentage of 70?

11. _____

12. Find 62% of 67.

12. _____

Literal Equations	**Score (out of 10):**

13. Solve for ***t***: $2s = r - 4t$ 13. _____

14. Solve for ***a***: $5a - b = x$ 14. Circle one: a b c d

a. $a = \frac{x+b}{5}$ b. $a = \frac{2+x}{5}$

c. $b = x + 5a$ d. $a = \frac{x}{5} + b$

15. Which equation is ***not*** equivalent to $mx + x = y$? 15. Circle one: a b c d

a. $y - x = mx$ b. $x(m + 1) = y$

c. $m(x) = y$ d. $y - mx = x$

Unit 2: Right Triangle Trigonometry

Simplify Radicals	**Score (out of 10):**

Simplify each radical completely. For credit you MUST show ALL work - NO DECIMALS!

16. $\sqrt{63}$ 16. _____

17. $\sqrt{300}$ 17. _____

18. $\sqrt{720}$ 18. Circle one: a b c d

a. $5\sqrt{12}$ b. $12\sqrt{5}$

c. $12\sqrt{12}$ d. $6\sqrt{10}$

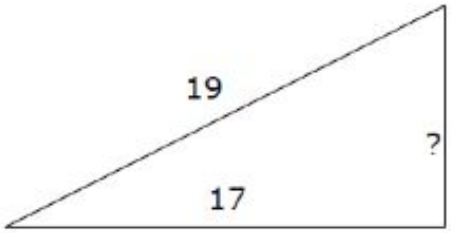
Pythagorean Theorem	**Score (out of 10):**

19. John leaves school to go home. He walks 4 blocks South and then 7 blocks East. How far is John from the school?

19. _____

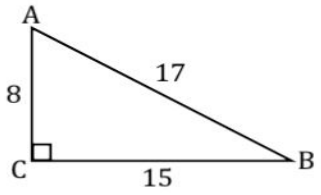
20. What is the length of the leg in the right triangle below?

20. _____



Trigonometric Ratios	**Score (out of 10):**

21. Find the cos (A) in the following triangle. Write your answer as a reduced fraction

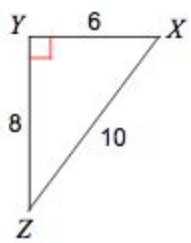


21. Circle one:

a. $\frac{8}{15}$ b. $\frac{15}{8}$

c. $\frac{8}{17}$ d. $\frac{15}{17}$

22. Find sin Z

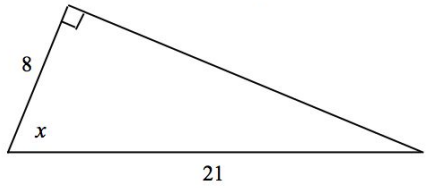


22. _____

Inverse Trigonometric Functions	**Score (out of 10):**

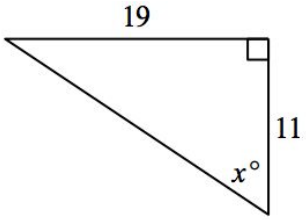
23. 23. Circle one: a b c d

Find the measure of x in the right triangle.



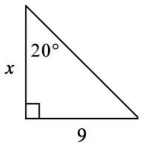
a. 22.4° b. 67.6° c. 20.9°

24. Find the measure of the missing angle to the nearest degree. 24. _____



Basic Trigonometry	**Score (out of 10):**

25. Find the length of side d in the triangle below. 25. Circle one: a b c d



Not drawn to scale

a. 3.3 b. 3.1 c. 24.7

26. The angle of elevation from a sailboat to the top of a 175 ft. lighthouse on shore is 12 degrees. How far from shore, rounded to the nearest whole foot, is the ship. (Draw a picture) 26. _____

Unit 3: Linear Relationships

Slope-intercept & standard form equations	**Score (out of 10):**

27. Ryan is planning a dinner for 17 people. He spent $25 on other groceries and it cost $1.15 per pound for Potatoes. Which function can represent the situation?
    a. *y= 17p+1.15*
    b. *y= 1.15p+17*
    c. y= 1.15p+25
    d. y= 1.15+25p

27. Circle one: a b c d

28. Which equation represents *10x - 5y = 17* in slope intercept form?

a. $y = 2x + \frac{17}{5}$ b. $y = 2x - \frac{17}{5}$

c. $y = \frac{1}{2}x + \frac{17}{5}$ d. $y = -\frac{1}{2}x + \frac{17}{5}$

28. Circle one: a b c d

29. Find the y-intercept of $y = 2x + 9$.

a. (0, 2) b. (2, 0)

c. (0, 9) d. (9, 0)

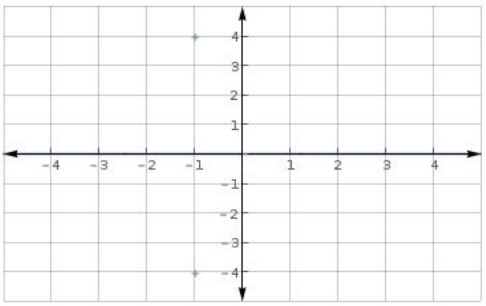
29. Circle one: a b c d

30. Find the x-intercept of $5x + 2y = 10$.

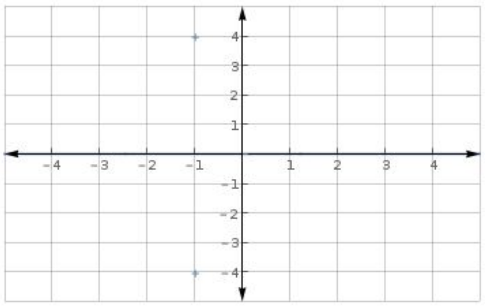
30. _____

31. Graph the equations on the coordinate grids provided to the right.

a. $y = \frac{3}{2}x - 3$



b. $4x + 2y = -8$



32. The Chess Club is selling crossword puzzles and sudoku puzzles to raise money for a tournament. Crossword puzzles cost $2.50 and sudoku puzzles cost $3. The club needs to raise $330. Write an equation to represent the situation

32. _____

33. What is the slope of the linear equation $y = -\frac{2}{5}x - 12$?

33. _____

34. Find the slope of the equation $12x + 6y = 13$.

34. Circle one: a b c d

a. 12
b. $-\frac{1}{2}$
c. 13
d. $\frac{1}{2}$

35. If a line has a negaitve slope, it goes _____ (fill in the blank) as it goes to the right.

35. Circle one: a b c d

A up
B down
C at an angle
D horizontal

36. Find the slope of the line that passes through the point (-55, 20) and (-55, 11)

36. _____

Identifying Linear Transformations	**Score (out of 10):**

37. Which statement is true for $f(x) = 2x-7$ and $g(x)= 8x + 4$?

37. Circle one: a b c d

a. f(x) and g(x) have the same y-intercept.
b. f(x) is steeper than g(x).
c. g(x) is steeper than f(x).
d. f(x) and g(x) have the same slope.

38. How do you know if the slope of a line is reflected when compared to its parent function $y = x$?

38. _____

Creating Linear Equations	**Score (out of 10):**

39. If *y* represents a number, which equation is the correct translation of the sentence: **Forty subtracted from eight times a number is 6**.

39. Circle one: a b c d

A $40 - 8y = 6$ **B** $8(y - 40) = 6$

C $8y - 40 = 6$ **D** $8(40 - y) = 6$

40. To which of the following situations can the equation $y = 6x + 12$ be best applied?

40. Circle one: a b c d

A The number of miles a person walks if he walks for 6 hours at the rate of 12 miles per hour.	**B** The total weight on a scale if 6 pounds is placed there initially and a series of 12-pound weights are added to it.
C The total wages earned by a waiter who is paid $6 per hour and earns $12 in tips.	**D** The combined length of 6 boards, each 12 feet longer than the width of a doorway.

41. The equation of a line that passes through the points (3, -1) and (0, 3) is:

41. Circle one: a b c d

A $y = 2x + 3$ **B** $y = \frac{1}{2}x + 3$

C $y = -\frac{1}{2}x + 3$ **D** $y = -2x - 3$

42. What is the linear equation in slope intercept form if the slope is -3 and contains a point of (3,12)?

42. _____

Solve a System of Linear Equations Using Any Method	**Score (out of 10):**

43. Which of the following **best** describes the graph of this system of equations?

$y = -x + 3$

$4y = -5x + 15$

A two identical lines

B two parallel lines

C two intersecting at exactly 1 point

D two lines intersecting in exactly 2 points

43. Circle one: a b c d

44. What is the solution to the system below? (Use any method - show all your work)

$$2x + 8y = 6$$
$$-5x - 20y = -15$$

44. _____

45. What is the solution to the system below?

$$-3x + 3y = 4$$
$$-x + y = 3$$

45. _____

Modeling Systems of Linear Equations	**Score (out of 10):**

46. An ice skating arena charges an admission fee for each child plus a rental fee for each pair of ice skates. John paid the admission fees for his six nephews and rented five pairs of ice skates. He was charged $32.00. Juanita paid the admission fees for her seven grandchildren and rented five pairs of ice skates. She was charged $35.25. If a represents the amount of the admission fee and r represents the skate rental fee, which of the following systems of equations can be used to represent this situation.

46. Circle one: a b c d

A $\begin{matrix} 32.00a+5r=5 \\ 35.25a+5r=7 \end{matrix}$ B $\begin{matrix} 5a+6r=32.00 \\ 5a+7r=35.00 \end{matrix}$ C $\begin{matrix} 6a+5r=32.00 \\ 7a+5r=35.25 \end{matrix}$ D $\begin{matrix} 8a+5r=32.00 \\ 7a+7r=35.00 \end{matrix}$

47. The school that Stefan goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 1 child ticket for a total of $38. The school took in $52 on the second day by selling 3 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

47. _____