Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Honors Algebra 1 - Summer Packet (Due Sept. 8, 2010) SHOW ALL WORK! Circle Answers!

1. Evaluate $3p$ when $p = 2$.

2. To find the mileage, or how many miles per gallon a car can travel, you can use the expression $\frac{m}{g}$, where m is the distance in miles and g is the number of gallons of gas used. Find the mileage for a car that travels 368 miles on 16 gallons of gas.

3. Complete the table.

Power	Base	Exponent	Product
2^5	?	?	?
?	3	4	?
?	?	?	125
r^8	?	?	?

____ 4. Madaline wants to plant some spices in a cube-shaped planter box. If one edge of the box measures 7 inches, how much soil will be needed to fill the planter?

a. 294 $in.^3$ b. 49 $in.^3$ c. 343 $in.^3$ d. 114 $in.^3$

5. Open-ended Problem: What is a variable? Include examples with your explanation.

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Simplify:

6. $5 \cdot 4^2 - 5$

7. Evaluate the expression $7.8x - 17.2$ when $x = 5$.

8. Evaluate $6y + 7 - 3x$ when $y = 3$ and $x = 4$.

____ 9. Evaluate $\frac{mn}{m+n}$ when $m = 10$ and $n = 11$.

a. $\frac{110}{21}$ b. $\frac{1011}{21}$ c. $\frac{121}{21}$ d. 1

SHOW ALL WORK! **Circle answers.**

10. The student government is selling flowers for homecoming. The project costs them \$20 for advertising and \$3 for each flower sold.
    a. Evaluate the expressions $3n + 20$ and $3(n + 20)$ when $n = 4$.
    b. Which expression shows their total cost? How do you know?
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11. The perimeter of a rectangle with length l and width w can be found using the expression $2(l + w)$. What is the perimeter of a rectangle with length 3 meters and width 2 meters?.
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12. Write a variable expression for "7 times the sum of x and 5."

13. Write an expression for "five less than three times a number x."

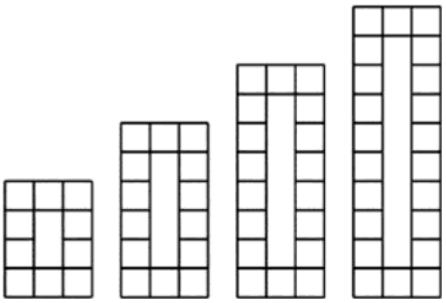
14. Keesha Thompson's cousin is 8 years older than Keesha. Write an expression for the age of Keesha's cousin.

____ 15. Brandon read 360 words in 12 minutes. How many words could he read in one minute?
    a. 40 words
    b. 372 words
    c. 42 words
    d. 30 words

16. A salesman gets a commission of \$2.65 on each item sold. One morning he sold 15 calculators and 19 pocket radios. Find his commission.

SHOW ALL WORK! **Circle answers.**

____ 17. How many small squares are required to form the 7th figure in the sequence?



a. 34 b. 28 c. 70 d. 50

18. **EXTENDED RESPONSE Write your answer on a separate piece of paper.**

A taxi ride costs $3.20 for the first one-fifth mile and 45 cents for each additional one-fifth mile. In addition, the passenger is charged 20 cents for each minute that the taxi is stopped in traffic or at a red light. During Cindy's 3.8-mile trip, the taxi was stuck in traffic for 6 minutes.
Part A What expression could you use to find the charge, in dollars, for the miles ridden in the taxi? Explain your answer.
Part B What expression would you use to find the charge, in dollars, for the time the taxi is stuck in traffic? Explain your answer.
Part C What expression would you use to find the total cost of the taxi ride? Explain your answer.
Part D What is the total cost of the taxi ride?

19. Write the following sentence as a mathematical statement. The sum of g and 3 is greater than or equal to x.

SHOW ALL WORK! **Circle answers.**

20. Write an equation or inequality for the verbal statement "seven is less than 4 times a number B."

21. Write an equation equivalent to the verbal statement "three times the sum of a number n and 7 is 16."

22. Is 3 a solution of $3x + 5 \leq 13$?

23. The members of a drama club are selling tickets to their next production. If their goal is to raise at least \$395, the number of tickets they must sell at \$2.80 each in order to meet their goal can be expressed by the inequality $2.80x \geq 395$. Is 147 a solution of the inequality?

____ 24. A store that sells gift baskets is having a promotional sale. Customers can make their own fruit baskets to use as gifts. Customers pay \$1.50 for a basket and add \$0.90 per pound for all types of fruit. The cost for a basket containing p pounds of fruit is \$7.90. Which equation could be used to find p, the number of pounds of fruit in this basket?

a. $(0.90 + 7.90)p = 1.50$
b. $1.50 + 0.90p = 7.90$
c. $1.50\left(7.90 + p\right) = 1.50$
d. $0.90 + 1.50p = 7.90$

25. To pay his car payment and insurance, Tony must earn at least \$150 a week at the music store. Tony's job pays \$10 a day plus \$2 for each CD he sells. He works 5 days a week.
a. Write an inequality that can be used to find the number of CDs Tony must sell each week.
b. Will Tony make his payments if he sells 30 CDs in a week? Explain your answer.

26. You are planning on buying a subwoofer that costs \$650. If you plan to save \$50 per month, how long will you have to save in order to purchase the subwoofer?

SHOW ALL WORK! **Circle answers.**

27. You want to jog 3 miles today. If you would like to finish jogging the 3 miles in 30 minutes, will a jogging speed of 5 miles per hour be fast enough?

28. It is possible to find the final digit of certain large powers without doing the multiplication.
    a. Describe a strategy to find the final digit in the number 3^{19}.
    b. Use your strategy to find the final digit in the number.

29. On the first day of school 11 students entered into your first period classroom before the starting bell rang. The teacher required each person to shake hands with everyone else exactly once.
    a. Describe a strategy for determining how many handshakes took place.
    b. Use your strategy to find the actual number of handshakes that took place among the 11 students.

Use a calculator to solve the problem.

30. Joel Killmer has a pumpkin patch with 14 rows of pumpkin plants. There are 8 rows with 76 pumpkins each and 6 rows with 104 pumpkins each. How many pumpkins does Joel have?

____ 31. A jumbo jet carries 330 passengers, 32 in first class, and the remainder in coach. If the average first class ticket is $860 and the average coach ticket is $360, how much will the airline gross if the plane is full?
    a. $267,800 b. $201,300 c. $137,780 d. $134,800

SHOW ALL WORK! **Circle answers.**

____ 32. Roberto drove from Miami to Jacksonville along Interstate 95. He left Miami at 6:30 A.M. and stopped in West Palm Beach from 8:00 A.M. to 8:45 A.M. for breakfast. The only other stop he made was for $\frac{1}{2}$ hour when he got off the highway to get gasoline and to stretch his legs. His average speed while driving on the highway was 50 miles per hour. If he reached Jacksonville at 2:30 P.M., how far did he drive, to the nearest 10 miles?

a. 340 miles b. 370 miles c. 310 miles d. 400 miles

33. **EXTENDED RESPONSE Write your answer on a separate piece of paper.**

Jacob drove from St. Petersburg, Florida to Phoenix, Arizona, stopping in Baton Rouge, Louisiana and El Paso, Texas along the way. He spent 43 hours driving in all, and his car averaged 28 miles per gallon of gas during each leg of the trip.

Part A Jacob's average speed was 48 miles per hour for the trip. What distance did he travel?

Part B How many gallons of gas did he use?

Part C Between St. Petersburg and Baton Rouge, a distance of 734 miles, Jacob's average speed was 46 miles per hour. What was his average speed from Baton Rouge to Phoenix? Explain your reasoning.

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____ 34. A grocery clerk sets up a display of 12-pack cartons of cola. There are 25 cartons at the base of the triangle and one at the top.

How many cartons of cola are needed for the complete display?

a. 15 b. 325 c. 30 d. 300

SHOW ALL WORK! **Circle answers.**

35. **EXTENDED RESPONSE Write your answer on a separate piece of paper.**

Jennifer is considering joining a fitness club that has a one-time joining fee of $75 and monthly dues of $44.50. There is a 5% discount for prepaying one year's dues (12 times the monthly dues, less the discount), but there is no refund available for non-use, whether dues are paid monthly or annually. On the monthly payment plan, a member may become inactive for one month each year. That means Jennifer could skip paying her dues for one month without losing her membership, as long as she did not want use the club during that time.

Part A Assume that Jennifer intends to take a 3-week vacation during one of the months in her first year of membership. Which plan should she choose if she wants the lowest total cost for that year? Might she prefer the more expensive option? Explain your reasoning.

Part B A little used option at the club is to pay a non-member day-use fee of $7.50. What percent of savings is realized by a member who prepays for a year compared to a non-member who uses the club 3 times per week for 49 weeks of the year? Show your calculations.

Part C What would the day-use fee for non-members need to be lowered to in order to be equivalent to the yearly-dues plan for a person who uses the club 3 times per week for 49 weeks of the year?

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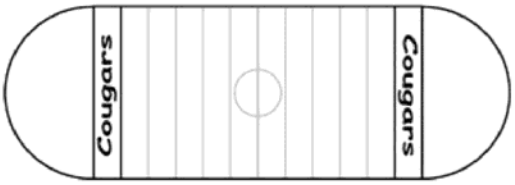
SHOW ALL WORK! **Circle answers.**

36. **EXTENDED RESPONSE Write your answer on a separate piece of paper.**

The rectangular portion of the football field below is 50 yards wide by 120 yards long. (The figure may not be drawn to scale.)



Use 3.14 for p in all calculations.
Part A Find the radii of the semi-circles on the ends of the field.
Part B Find the perimeter of the field.
Part C Find the area of the field. Explain your reasoning using formulas.

37. Find the range of the function.

Input	Output
1	11
9	6
4	5

38. Does the input-output table represent a function? If it does represent a function, list the domain and range.

Input	3	4	5	6
Output	14	19	24	29

SHOW ALL WORK! **Circle answers.**

____ 39. Complete the input-output table for the function $y = 2x - 3$.

Input	Output
2	?
?	5
3	?
?	9

a.

Input	Output
2	3
4	5
3	4
6	9

b.

Input	Output
2	1
4	5
3	3
6	9

c.

Input	Output
2	1
5	5
3	3
6	9

d.

Input	Output
2	1
4	5
3	3
8	9

40. Decide whether the information defines a function. If it does, state the domain of the function.

Input	*a*	*b*	*c*	*d*
Output	0	1	2	1

41. Make an input-output table to represent the function. Use 1, 2, 3, 4, and 5 as the domain.
$y = 3x + 9$

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SHOW ALL WORK! **Circle answers.**

42. Which of the functions represents the input-output table?

Input	Output
0	3
1	5
2	7
3	9

Functions
$y = 2x - 3$
$y = 2x + 3$
$y = 2x - 4$
$y = 3x + 3$

____ 43. A bag of chips costs \$2.33. Your total grocery bill, b, is a function of the number of bags of chips, n, you purchase. Write an equation to represent this function.

a. $n = 2.33b$

b. $b = \frac{2.33}{n}$

c. $\frac{b}{2.33} = n$

d. $b = 2.33n$

44. A music store sells CDs for \$12.99 each.
a. Write a rule for the cost of CDs as a function of the number of CDs purchased.
b. Let the domain equal 0, 1, 2, and 3. Make a table and identify the range.

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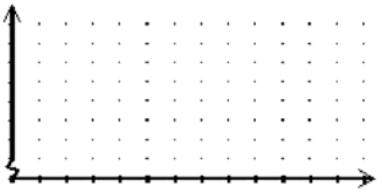
____ 45. For which value of x is the relation *not* a function?
{(0, 1), (x, 0), (3, 5), (2, 6)}

a. 1 b. 3 c. 4 d. 6

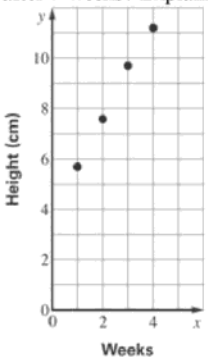
SHOW ALL WORK! **Circle answers.**

46. The table shows the study times and test scores for a number of students. Draw a scatter plot of the data. Put study time on the horizontal axis and test score on the vertical axis.

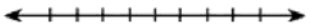
Study Time (min)	5	12	18	21	25	31	33	38
Test Score	58	58	66	64	67	68	74	72



47. A student measured the height of a plant for four weeks for a science project. The graph below shows the plant's height each week. Based on the graph, is 10 centimeters a reasonable estimate for the height of the plant after 5 weeks? Explain.



48. Graph the numbers 1.5 and –2.5 on the number line. Which is greater?



49. Order the numbers from least to greatest. $7, -\frac{5}{6}, \frac{2}{3}, 0, -\frac{1}{2}, \frac{4}{5}$

SHOW ALL WORK! **Circle answers.**

____ 50. The chart below shows the low temperature on January 11 for five towns.

Low Temperature (°F) Jan. 11	
Bender	7
Doeville	3
Hermiton	–6
Rapids	–10
Weaver	–3

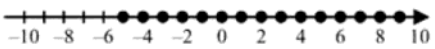
Which town had the second-lowest temperature?

a. Hermiton b. Weaver c. Rapids d. Doeville

51. After a week of tracking imaginary stock portfolios, four students each calculated the change in the price of the best performing stock they had chosen. Some students preferred decimal form, some preferred fraction form, and the changes are shown in the table below. Which stock was the second best performer?

Stock	A	B	C	D
Change in price	1.55	$\frac{7}{8}$	$3\frac{3}{8}$	– 3.25

____ 52. Select the description that matches the graph.



a. integers greater than or equal to –5
b. integers less than or equal to –6
c. integers less than or equal to –7
d. integers greater than or equal to –6

____ 53. An elevator in Casson's department store started on the ground floor. It went up 7 floors, down 8 floors, up 7 floors, and down 3 floors. Which expression could be used to find the total number of floors through which the elevator passed?

a. $|+7| - |-8| - |+7| - |-3|$
b. $(+7) - (-8) - (+7) - (-3)$
c. $|+7| + |-8| + |+7| + |-3|$
d. $(+7) + (-8) + (+7) + (-3)$

____ 54. Use the concept of opposites to simplify $-\left[-(-4)\right]$.

a. 4 b. $\frac{1}{4}$ c. –4 d. $-\frac{1}{4}$

SHOW ALL WORK! **Circle answers.**

55. Writing: Explain the meaning of the term absolute value. Give examples to illustrate your explanation.

Tell whether the number is a whole number, an integer, or a rational number.

56. $-3.\overline{478}$

57. -241

58. 13

____ 59. Using rules of addition, show how to add the two real numbers. $-6 + (-15)$

a. $-(6 - 15)$ -9
b. $-(6 + 15)$ -21
c. $-(6 + 15)$ 9
d. $(6 + 15)$ 21

____ 60. Which of the following illustrates the associative property of addition?

a. $7 + (2 + 3) = 7 + (2 + 3)$
b. $(11 + 12) + 3 = 11 + (12 + 3)$
c. $2 + 4 = 4 + 2$
d. $6 + 3 = 9 + 0$

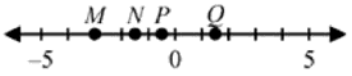
61. Which property of addition is used in the following expression?
$3 + 5 = 5 + 3$

62. Find the sum $28.97 + (-7.29) + (-5.31)$.

63. The yearly profit or losses for a restaurant are shown for a period of three years. Use a calculator to determine the restaurant's overall profit or loss for the three years.

1995	–$22,144.33
1996	$2558.79
1997	$7147.86

____ 64. M, N, P, and Q are four points on the number line below.



Which pair represents two numbers that have a sum that is less than the smaller of the pair?

a. M and Q
b. N and Q
c. N and P
d. P and Q

SHOW ALL WORK! **Circle answers.**

65. The following table shows the annual profits for two small florist shops.
a. The owner of Shop A wants to find the total profit for all three years. The owner adds the two positive amounts first, then adds this sum to the negative amount. Could he also add the amounts for years 1 and 2, then add this sum to the amount for year 3? Explain.
b. Find the total profit for all three years for each shop.
c. Which shop had the greater total profit? How much greater was its profit?

Year	Profit* for Shop A	Profit* for Shop B
1	-4.7	14.5
2	27.5	-0.2
3	122.3	130.4

* in thousands of dollars

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66. Simplify the expression $-\left[-(4+3)\right]$.

Find the difference.

67. $(-10) - (-7)$

68. Evaluate the expression $28 - (-x) - |10|$ when $x = -15$.

69. The morning temperature was -2°. By noon, the temperature was 1°. What was the change in temperature?

SHOW ALL WORK! **Circle answers.**

70. The daily closing prices of a company's stock for one week are shown below. Find the change in closing price from day to day.

Day	Closing Price	Change
M	37.00	?
T	42.20	?
W	51.10	?
Th	62.40	?
F	51.70	?

71. Jamie dropped a quarter from a height of 6 feet above the ground into a wishing well whose bottom was 5 feet below ground level. Write an expression representing the change in elevation of the quarter. How far did the quarter travel?

72. In a week, a hiker goes from a mountain elevation of 2430 meters to a valley with an elevation of −12 meters.
a. What was the hiker's change in elevation?
b. If the hiker travels from the valley to the mountain, would the change be the same as what you found in part (a)? Explain.

Find the product.

____ 73. $-5\,(-2)$

a. −7 b. 10 c. −10 d. −3

74. Find the product $(-8)|-10|$.

____ 75. Identify the product that will be negative.

a. $(2)(3)(4)(5)$
b. $(-2)(-3)(-4)(-5)$
c. $(2)(-3)(-4)(5)$
d. $(-2)(-3)(-4)(5)$

____ 76. Which multiplication property is illustrated by the product $(7\cdot5)\cdot4 = 7\cdot(5\cdot4)$?

a. associative
b. property of opposite
c. commutative
d. identity

77. A deep-sea diver must descend and ascend in short steps to equalize pressure on her body. If the diver rises toward the surface too quickly, she may suffer from a physical condition called "the bends." Suppose the diver descends to the bottom in three steps of 15 feet each. How far did the diver descend?

SHOW ALL WORK! **Circle answers.**

Identify the property shown.

78. $5 \cdot 1 = 5$

Simplify the expression.

79. $10(-2c)$

Identify the property illustrated.

80. $56 \cdot (-5) = (-5) \cdot 56$

81. $\left(xy^2z^3\right) \cdot 1 = \left(xy^2z^3\right)$

82. $\left(\frac{x+8}{y-3}\right) \cdot 0 = 0$

83. $-1 \cdot (-87) = 87$

Use the distributive property to write an equivalent variable expression.

84. $4(8 - 8x)$

SHOW ALL WORK! **Circle answers.**

Identify the terms, like terms, coefficients, and constant terms. Then simplify the expression.

____ 85. $4b + 7 - 5b - 19$

a. terms: $4b$, -7, $5b$, 19
like terms: $4b$ and $5b$, -7 and 19
coefficients: 4, 5
constant terms: -7, 19
simplified expression: $9b + 12$

b. terms: $4b$, 7, $-5b$, -19
like terms: $4b$ and $-5b$, 7 and -19
coefficients: 4, -5
constant terms: 7, -19
simplified expression: $-b - 12$

c. terms: $4b$, -7, $5b$, -19
like terms: $4b$ and $5b$, -7 and -19
coefficients: 4, 5
constant terms: -7, -19
simplified expression: $9b - 26$

d. terms: $4b$, 7, $-5b$, 19
like terms: $4b$ and $-5b$, 7 and 19
coefficients: 4, -5
constant terms: 7, 19
simplified expression: $-b + 26$

86. Simplify the expression $2(2 - x) - 3x$.

Writing:

87. Maria wrote this mathematical sentence: $2x^4 + 2x^4 = 4x^8$. Explain her mistake and how to correct it.

____ 88. Bill wants to simplify the following expression.
$5(3x - 2y) + 2(x + 2y) - 3(3x - 2y)$
Which of the following expressions is equivalent to the expression above?

a. $8x$ b. $8x - 12y$ c. $8xy$ d. $8x - 8y$

89. Simplify the expression $3(10 + 4x) + 4(10 + 4x)$.

SHOW ALL WORK! **Circle answers.**

90. A book bindery sells copies of classic novels with hand-tooled leather bindings. Each book uses \$15 worth of materials and binders are paid \$18 per hour. Each book sells for \$125, so the company's profit, P, is given by the formula $P = n(125 - 15 - 18t)$, where t is the number of hours spent binding one book and n is the number of books bound. Write a simplified equation for the profit earned if 50 copies of one novel are sold.

91. Sheryl saves her dimes and quarters. She currently has a total of 24 coins, all of which are dimes and quarters.
a. Write an equation that gives the total amount of money M (in dollars) as a function of the number of dimes d she has.
b. Show how you can use the distributive property to find the total amount of money she has if she has 13 dimes.
c. If Sheryl's 24 coins have a total value of \$4.80, how many dimes and quarters does she have? Use a table of values and explain how you found your answer.

____ 92. Find the quotient. $12 \div \left(-\frac{4}{9}\right)$

a. $\frac{1}{27}$ b. $\frac{3}{9}$ c. $\frac{9}{4}$ d. -27

A student measured the temperature in degrees Celsius for several winter days and recorded the data in a list. Find the mean of the temperatures listed.

____ 93. $3^\circ, -10^\circ, -8^\circ, 2^\circ, -11^\circ, 0^\circ, -7^\circ, -1^\circ$

a. $-2^\circ C$ b. $-5^\circ C$ c. $-4^\circ C$ d. $-3^\circ C$

94. Simplify the expression $\frac{15d + 24}{3}$.

95. Simplify the expression $\frac{-42 - 18x}{-6}$.

SHOW ALL WORK! **Circle answers.**

____ 96. Dividing by 3 is the same as multiplying by what fraction?

a. $\frac{1}{4}$ b. $\frac{2}{3}$ c. 4 d. $\frac{1}{3}$

97. Write the multiplicative inverse of $\frac{1}{13}$.

Find the quotient.

98. $\frac{3}{40} \div \frac{1}{8}$

Find the quotient.

99. $3\frac{1}{2} \div 10$

Simplify:

____ 100. $\sqrt{25}$

a. 5 b. 25 c. 0.5 d. 50

101. Find all square roots of the number 0.25.

Estimate the square root to the nearest integer.

____ 102. $\sqrt{6}$

a. –2 b. 36 c. 2 d. –36

____ 103. Which of the following is an irrational number?

a. $\frac{-2}{13}$ c. 0.9262626 . . .

b. $\sqrt{169}$ d. $\frac{\pi}{4}$

SHOW ALL WORK! **Circle answers.**

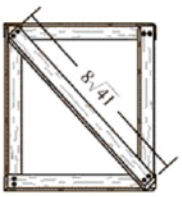
Tell whether the number is *rational* or *irrational*. Give a reason for your answer.

104. $\sqrt{\frac{169}{64}}$

Order the numbers from least to greatest.

105. $0.\overline{89}$, $\frac{17}{19}$, $\sqrt{0.81}$, $2\sqrt{2}$, 1.5

____ 106. A gardener building a wooden garden gate wants to brace it as shown in the picture below. The gardener used the Pythagorean theorem to determine that the brace must be $8\sqrt{41}$ inches long.



Which of the following numbers is closest to $8\sqrt{41}$?

a. 48 b. 320 c. 56 d. 51