Your Name _____ Teacher _____ Block _____

Grade (please circle): 9 10 11 12 Course level (please circle): Honors Level 1

LHS Algebra Pre-Test 2005

Instructions

- The purpose of this test is to see whether you know Algebra 1 well enough to be prepared for Algebra 2.
- For fairness, since some students may not have calculators yet, this is a no-calculator test.
- Make sure that you show your work where requested.
- For all graphing grids on this test, the dimensions are $-10 \le x \le 10$, $-10 \le y \le 10$.
- This test has a 50-minute time limit. Do the best you can in the allowed time.

Test format and scoring

		Your scores
Part A. Multiple choice questions	7 questions, 2 points each	_____ out of 14
Part B. Shorter problems	7 problems, 4 points each	_____ out of 28
Part C. Longer problems	3 problems, 6 points each	_____ out of 18
		TOTAL: _____ **out of 60**

Part A. Multiple choice

Directions: Circle the letter in front of the correct answer to each question.

1. The coordinates of several points of a line are given in the table. Which of the following could be an equation for this line?

x	y
–8	10
–6	7
–4	4
–2	1
0	–2
2	–5
4	–8
6	–11

(A) $y = 1.5x - 2$

(B) $y = -1.5x - 2$

(C) $y = -2x - 3$

(D) $y = 3x - 2$

(E) $y = -3x - 2$

2. Suppose that $f(x)$ is a linear function with the values $f(-1) = 8$ and $f(1) = 2$. The graph of $f(x)$ is a line. What is the slope of this line?

(A) 1/3
(B) –1/3
(C) 3
(D) –3
(E) –9

3. Simplify $2 \cdot \sqrt{3} \cdot \sqrt{12}$.

(A) $2 \cdot \sqrt{15}$ (B) $6 \cdot \sqrt{2}$ (C) $\sqrt{72}$ (D) 12 (E) none of these

4. Which one of the following expressions is **not** equal to all of the others?

(A) $2x^{-3}$
(B) $\dfrac{1}{2^{-1}x^3}$
(C) $\dfrac{2x^5}{x^8}$
(D) $\dfrac{2}{x^3}$
(E) $\dfrac{2x^5}{x^{14}}$

5. Find the *zeroes* (also called the *roots*) of the function $y = x^2 + 2x - 24$.

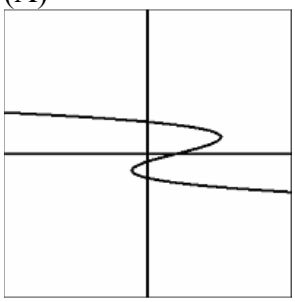
(A) $x = 4$ and $x = -6$
(B) $x = 3$ and $x = -8$
(C) $x = -4$ and $x = 6$
(D) $x = -3$ and $x = 8$
(E) None of the above answers is correct.

6. Which of the following expressions is equal to $\dfrac{\left(\frac{a}{b}\right)}{\left(\frac{3}{c}\right)}$?

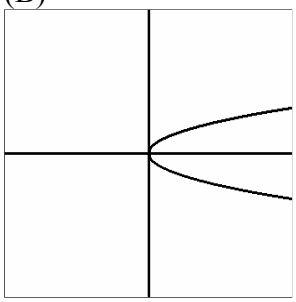
(A) $\dfrac{3a}{bc}$ (B) $\dfrac{bc}{3a}$ (C) $\dfrac{ab}{3c}$ (D) $\dfrac{ac}{3b}$ (E) $\dfrac{3b}{ac}$

7. Which one of the following graphs could be the graph of a **<u>function</u>** ?

(A)



(B)



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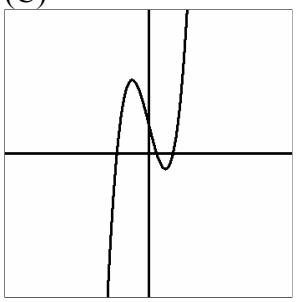
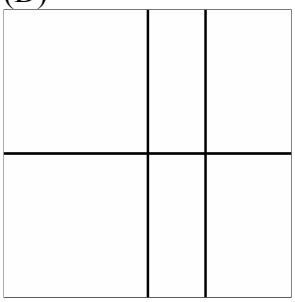


(D)



Part B. Short questions

Directions: Write answers to the following questions. Make sure you show your work where requested.

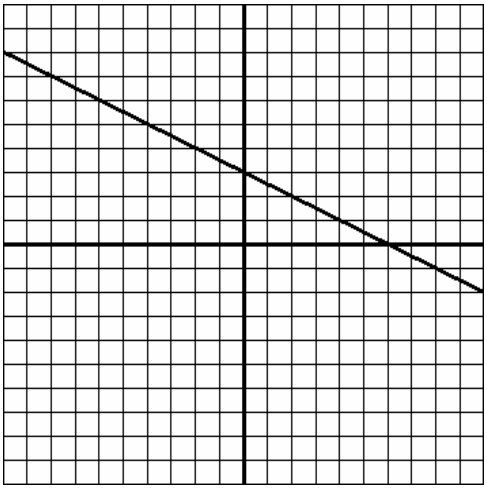
8. Solve this system of equations, using any method.

$$5x + 2y = 2$$
$$2x - y = 8$$

Show your solving steps here:

Write your solution here:

9. The graph of line L is shown on the grid.



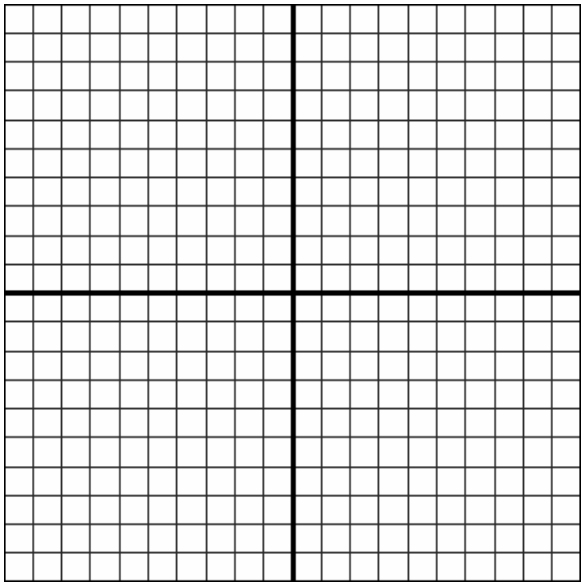
a. Write an equation for another line that would be *parallel* to the graph of L.

b. Write an equation for another line that would be *perpendicular* to the graph of L.

10. Here is a word description of a function: "Add 2, then divide by 3."

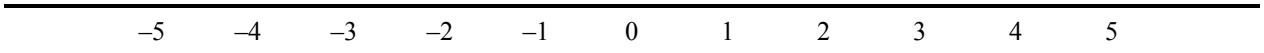
a. Write an equation for this function. Call the input x and the output y.

b. On the grid, make a graph for this function.



11. a. Solve the inequality $|2x - 5| < 3$.

b. Graph the solution on the number line below.

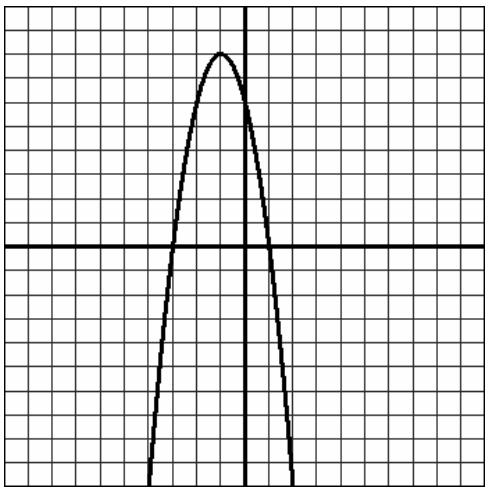


12. Multiply $(x^4 + 5x^3 - 3x) \cdot (x^3 + 2)$. Then, simplify your answer as much as possible.

13. a. Factor $4x^2 - 8x - 5$.

b. Using the factors you found in part **a**, find the solutions to the equation $4x^2 - 8x = 5$. Show how you get your answers.

14. The graph of a quadratic function $f(x) = ax^2 + bx + c$ is given on the grid.



a. Find the solutions to the equation $f(x) = 0$.

b. At what x does $f(x)$ have its maximum value?

Part C. Long questions

Directions: In this part of the test, you must show all of the work needed to solve the problems. Partial credit will be given where appropriate.

15. a. The French Club currently has 35 members. Suppose that the membership grows by 7 people each month. Let $f(x)$ stand for what the membership will be after x months. Write a function formula for $f(x)$.

b. The German Club currently has 32 members. Suppose that the membership grows by 25% each month. Let $g(x)$ stand for what the membership will be after x months. Write a function formula for $g(x)$.

c. Which club, the French Club or the German Club, will have more members 2 months from now? Show calculations supporting your answer.

16. Dr. Dull gave a boring lecture in the assembly hall last week.

When his lecture began, there were 100 people in the hall.
After 10 minutes, there were 86 people left in the hall.
After 20 minutes, there were 72 people left in the hall.
After 30 minutes, there were 58 people left in the hall.
After 40 minutes, there were 44 people left in the hall.

Let x = the number of minutes that have passed; $P(x)$ = the number of people left in the hall.
The relationship between these variables is linear.

a. Write a function formula for $P(x)$.

$P(x) =$ _____

b. Evaluate $P(25)$, and explain the meaning of the answer in the context of the problem.

c. Use $P(x)$ to answer this question: After how many minutes will there be 23 people left in the room? Show the work leading to your answer.

17. Read this problem situation:

A restaurant sells burgers and hotdogs for lunch. The people at one table buy 3 burgers and 1 hotdogs, and pay $8.25. The people at another table buy 1 burger and 2 hotdogs, and pay $5.25. What are the selling prices for burgers and hotdogs?

a. Identify the two variables needed to answer the question. Make up a letter name for each variable.

b. Write two equations that represent the given information.

c. Using a method of your choice, solve the system of equations. Show your steps.

d. Write a sentence that answers the question, "What are the selling prices for burgers and hotdogs?"