

Your Name _____

Teacher _____

ALGEBRA 1 — FINAL EXAM 2006

Overall instructions:

- There is a mix of easier and harder problems. Don't give up if you see some questions that you don't know how to answer. Try moving on to other problems.
- Everyone is allowed $1\frac{1}{2}$ hours, plus $\frac{1}{2}$ hour of extra time. Use your time well. Don't stop working before you're done.
- You may use a calculator anytime that it is helpful. Sharing of calculators is forbidden.
- Use the back of any page for scratch work. Only the fronts of the pages will be graded.
- Be sure to use the Note Sheet that your teacher will give you.

Part A. Multiple choice questions

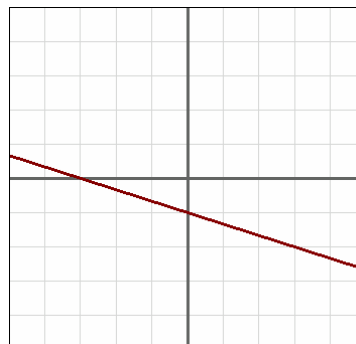
(2 points each)

Directions: Circle the letter (A, B, C, or D) next to the correct answer.

1. Which of these is equal to $5(8 - x)$?
 - (A) $5x - 40$
 - (B) $40 - 5x$
 - (C) $x - 40$
 - (D) $5 - 8x$

2. Suppose $2(2 - y) = 3x$. When $y = 8$, what is the value of x ?
 - (A) $-20/3$
 - (B) $20/3$
 - (C) 4
 - (D) -4

3. Which of these functions has the graph shown here?
 - (A) $f(x) = 3x + 1$
 - (B) $f(x) = \frac{1}{3}x + 1$
 - (C) $f(x) = \frac{1}{3}x - 1$
 - (D) $f(x) = -\frac{1}{3}x - 1$



4. Which of these points ***does not*** lie on the graph of $y = -2x + 7$?
- (A) $(-1, 9)$
 - (B) $(4, -1)$
 - (C) $(-3, 1)$
 - (D) $(-2, 11)$
5. Between a pair of points on the line $y = 5x - 2$, suppose that the ***rise*** is 15. Then the ***run*** is
- (A) 3
 - (B) 4
 - (C) 5
 - (D) 10
6. Find the slope of the line that passes through the points $(-4, 2)$ and $(6, 6)$.
- (A) $-2/5$
 - (B) $5/2$
 - (C) $-5/2$
 - (D) $2/5$
7. Sandra has been saving money on a weekly basis. She currently has \$1125 in her account. If she has been saving the same amount of money for the past 75 weeks, how much money has she deposited each week.
- (A) \$20
 - (B) \$15
 - (C) \$10
 - (D) \$5
8. A family membership at a tennis club costs a flat fee of \$150, plus \$25 per person. If n stands for the number of people, then the membership cost is modeled by
- (A) $25n + 150$
 - (B) $150n + 25$
 - (C) $150 + 25 + n$
 - (D) $175n$

9. Find the intersection of the lines $y = 2x + 1$ and $y = -5x - 6$.

- (A) (1, 1)
- (B) (1, 2)
- (C) (-1, -1)
- (D) (-1, 2)

10. Which of these lines **does not intersect** the line $y = -2x + 3$?

- (A) $y = 2x$
- (B) $y = 2x - 3$
- (C) $y = 2x + 3$
- (D) $y = -2x - 3$

11. Solve the inequality $-3x + 8 < 11$.

- (A) $x < -1$
- (B) $x > -1$
- (C) $x > 1$
- (D) $x < 1$

12. Which of the following is equal to $m^{-9} \cdot m^9$?

- (A) m^{18}
- (B) m^{-18}
- (C) 1
- (D) 0

13. Which of the following is equal to $(a^5b^4)^7$?

- (A) $a^{35}b^{28}$
- (B) a^5b^{11}
- (C) $a^{-2}b^{-3}$
- (D) $a^{12}b^{11}$

14. In how many ways can the letters in the word BEACH be rearranged?

- (A) 120
- (B) 60
- (C) 30
- (D) 5

15. My grocer's freezer has this selection of pies.

apple	8
pumpkin	16
blueberry	5
pecan	11

If I choose to buy a pie at random to bring to a July 4th cookout, what is the probability that I buy a pumpkin pie

- (A) $1/5$
- (B) $2/5$
- (C) $16/5$
- (D) $1/2$

16. Here are the number of text messages students send to each other on a daily basis

25, 23, 17, 15, 19, 21, 28, 30, 26, 28

Find the **median** of these scores.

- (A) 20
- (B) 21
- (C) 23
- (D) 24

17. When multiplied, which of the following gives you $x^2 + 2x - 8$?

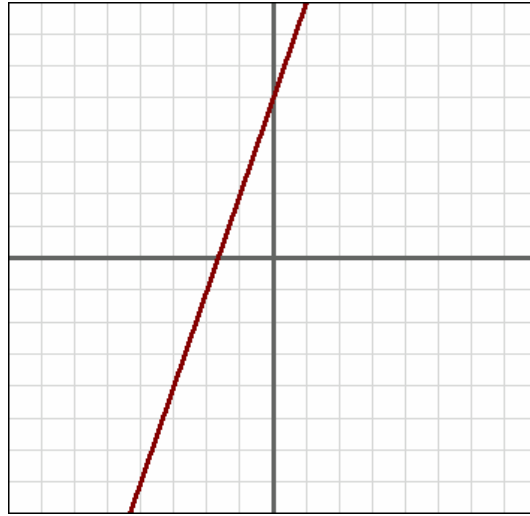
- (A) $(x-4)(x-2)$
- (B) $(x+4)(x-2)$
- (C) $(x-4)(x+2)$
- (D) $(x+4)(x+2)$

Part B. Equations, tables, and graphs

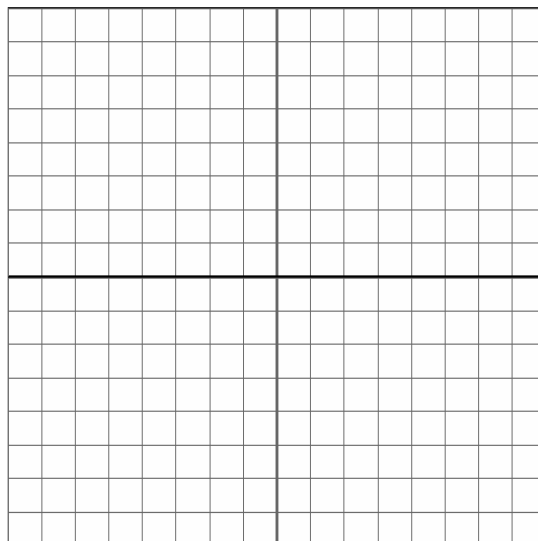
(8 points each)

18. a. Make a table of (x, y) pairs for the given line.

x	y

**b.** Write an equation for the line given above.**19.** Here is a word description of a different function: “Multiply by -5, then add 2.”**a.** Write an equation for this function. Call the input x and the output y .**b.** Make a table and a graph for this function.

x	y

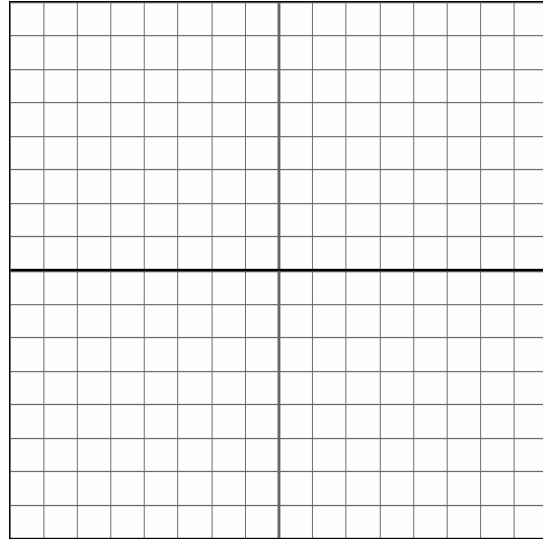


20. You are given this information about a linear function $f(x)$:

- $f(1) = -3$.
- The slope of the graph of $f(x)$ is 3.

Answer these questions about function $f(x)$:

- a. On the grid, draw the graph of $f(x)$.
- b. Write a function formula for $f(x)$.



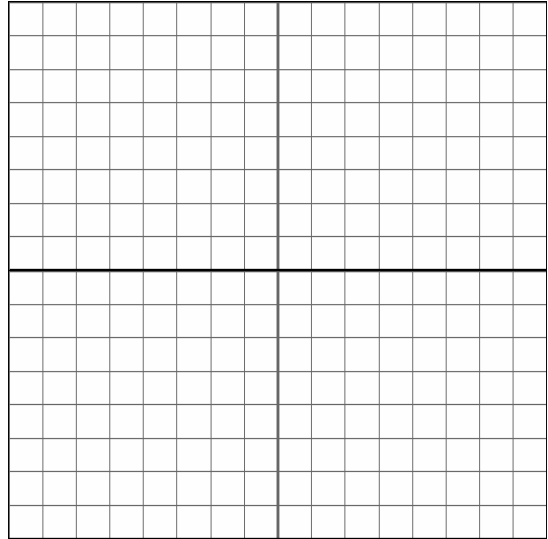
21. A table of values for a linear function $f(x)$ is given.

- a. What do the numbers in the *input* column change by?
- b. What do the numbers in the *output* column change by?

x	$f(x)$
-6	-7
-3	-5
0	-3
3	-1
6	1
9	3
12	5
15	7
18	9

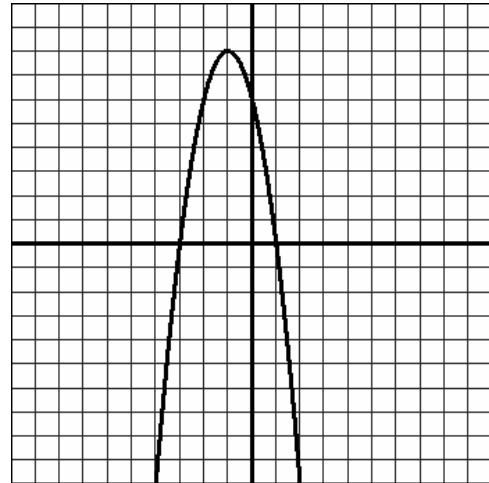
- c. What is the slope of the line for the graph of $f(x)$?
- d. What is the y -intercept?
- e. Write a function formula equation for $f(x)$.

22. a. On the axes at the right, sketch the graph of the equation $y = -2$



b. Is the graph from part a the graph of a *function*? Tell why or why not.

23. The graph of a quadratic function $f(x)$ is given on the grid.



a. What are the zeroes of $f(x)$?

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

24. Match the verbal statement to the algebraic expression that best matches it.

2 less than five times a number		a. $x \geq 100$	f. $\sqrt{x} + 8$
the sum of the square root of a number and 8		b. $5x - 2$	g. $x \leq 100$
a number is at least 100		c. $3(x + 1)$	h. $2 < 5x$
4 more than the square of a number		d. $\sqrt{x+8}$	i. $3x + 1$
3 times the sum of a number and 1		e. $x^2 + 4$	j. $4x^2$

Part C. Solving problems — show your work

(5 points each)

Directions: Show your work. If you use a calculator table or graph as part of your solution, copy it down onto your test paper.

25. Using any method, solve this equation.

$$x+8 = 3(x - 4)$$

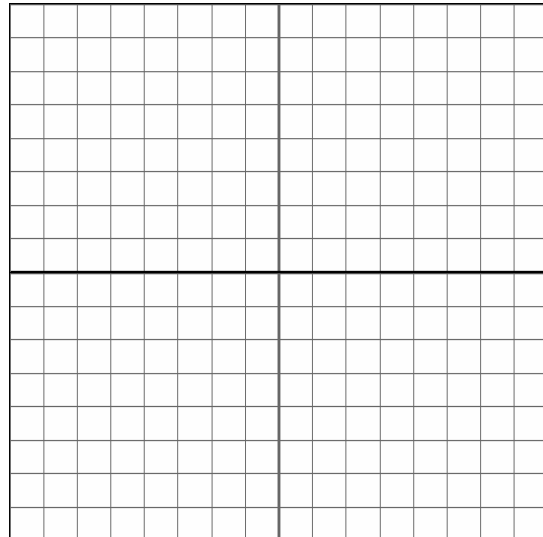
Show work here:

Write your solution here:

26. Using any method, solve this system of equations.

$$\begin{cases} x + 2y = 1 \\ 5x - 4y = -23 \end{cases}$$

Show work here:



Write your solution here:

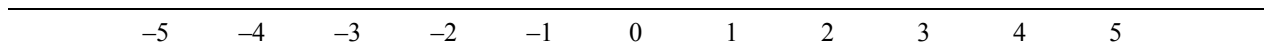
27. Solve this inequality, then make a number line graph of the solution.

$$-2 \leq 3x + 4 < 13$$

Show work here:

Write your solution:

Graph your solution:



28. Using any method, solve this equation.

$$|2x + 5| = 17$$

Show work here:

Write your solution here:

29. Multiply the following and combine like terms where appropriate. Use the multiplication table method to help you if you wish.

a. $(2x-1)(3-x)$

b. $(a+b)(a-b)$

30. Simplify the expressions as much as possible. Show your steps. Express your answer with positive exponents.

a. $(A^{-1}B^3)^5$

b. $\frac{A^3B}{AB^4}$

Part D. You make them up (2 points each)

Directions: These problems ask you to make up equations, tables, and graphs that meet certain conditions.

32. Make up an equation for a line that is **less steep than** the line $y = 3x - 7$.

33. Make up an input-output table for a line that has a slope of $-1/2$.

input (x)	output (y)

34. Make up an equation for a line that **slopes upward**(as you go from left to right) with a y -intercept that is positive.

35. Make up an input-output table that is...

<u>not a function</u>			<u>is a function</u>		
	input (x)	output (y)		input (x)	output (y)

36. Make up a graph that has a **negative slope**.

