

## Algebra I H Semester 1 Practice Exam

1. Find the product:  $-8 \begin{bmatrix} -3 & 2 & 4 \\ 0 & 5 & -7 \\ 6 & 6 & -5 \end{bmatrix}$

A.  $\begin{bmatrix} 24 & -16 & -32 \\ 0 & -40 & 56 \\ -48 & -48 & 40 \end{bmatrix}$

B.  $\begin{bmatrix} -3 & 2 & 4 \\ 0 & -40 & 56 \\ 6 & 6 & -5 \end{bmatrix}$

C.  $\begin{bmatrix} 24 & -16 & -32 \\ 0 & 5 & -7 \\ 6 & 6 & -5 \end{bmatrix}$

D.  $\begin{bmatrix} 24 & 2 & 4 \\ 0 & 5 & -7 \\ 48 & 6 & -5 \end{bmatrix}$

2. Find the difference of the matrices:

$$\begin{bmatrix} 4 & -1 \\ 7 & 5 \end{bmatrix} - \begin{bmatrix} 2 & -2 \\ 5 & -6 \end{bmatrix}$$

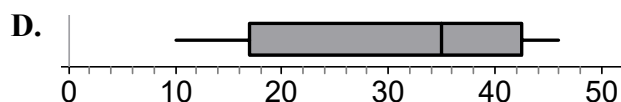
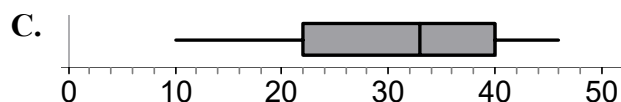
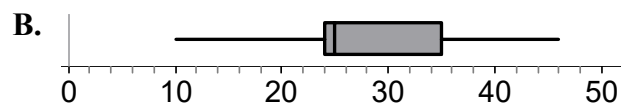
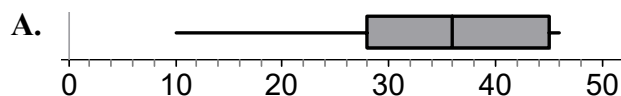
A.  $\begin{bmatrix} 2 & 1 \\ 2 & -1 \end{bmatrix}$

B.  $\begin{bmatrix} 2 & 1 \\ 2 & 11 \end{bmatrix}$

C.  $\begin{bmatrix} 2 & -3 \\ 2 & -1 \end{bmatrix}$

D.  $\begin{bmatrix} 6 & -3 \\ 12 & -1 \end{bmatrix}$

3. Which box-and-whisker plot below represents the following set of data: {10, 14, 22, 28, 32, 34, 36, 40, 45, 46}?



4. There are 20 equally-sized sections on a spinner. There are 6 blue sections, 3 yellow sections, 9 red sections and 2 green sections. What is the probability of the spinner landing in a blue or yellow section on the first spin?

A.  $\frac{1}{10}$

B.  $\frac{3}{20}$

C.  $\frac{3}{10}$

D.  $\frac{9}{20}$

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5. There are 5 blue socks, 3 red socks, and 2 green socks in a drawer. What is the probability of randomly choosing one blue sock, then one red sock, without putting the blue sock back first?

- A.  $\frac{3}{20}$
- B.  $\frac{1}{2}$
- C.  $\frac{1}{4}$
- D.  $\frac{1}{6}$

6. Simplify the expression:

$$3 \cdot 4^2 - [24 \div (6 - 4)].$$

- A. 12
- B. 36
- C. 48
- D. 132

7. Evaluate the expression

$$4 + 2^3 [x \div 3(x - 6)] \text{ when } x = 9.$$

- A. 12
- B. 76
- C. 90
- D. 108

8. Evaluate the expression  $3x - 5y + 7$  when

$$x = \frac{4}{3} \text{ and } y = 2.$$

- A. -13
- B. -5
- C. 1
- D. 9

9. Find the equation that matches the pattern represented in the table:

$x$	0	1	2	3	4
$y$	10	21	32	43	54

- A.  $y = x + 10$
- B.  $y = x + 11$
- C.  $y = 2x + 11$
- D.  $y = 11x + 10$

10. Simplify the expression  $8 + 5(x + 3) - 2x$ .

- A.  $3x + 11$
- B.  $7x + 11$
- C.  $3x + 23$
- D.  $-7x + 23$

11. Simplify the expression

$$10x^2 - 8x + 20 + 3x + 4x^2 - 8.$$

- A.  $14x^2 - 5x + 12$
- B.  $13x^2 - 4x + 12$
- C.  $14x^2 - 11x + 12$
- D.  $2x^2 + 7x + 12$

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12. Write an expression for the perimeter of the rectangle:



- A.  $10yz + 5y$
- B.  $10y + 4z + 2$
- C.  $7yz + 1$
- D.  $14yz + 2$

13. Which of the following tables represent functions?

I.

Input	Output
1	4
2	3
3	2
4	1

II.

Input	Output
1	1
2	2
3	□3
3	□4

III.

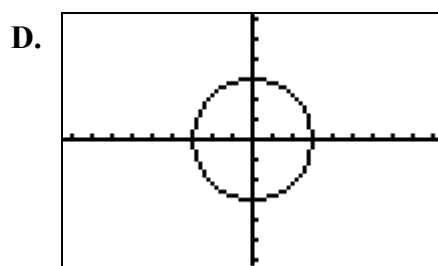
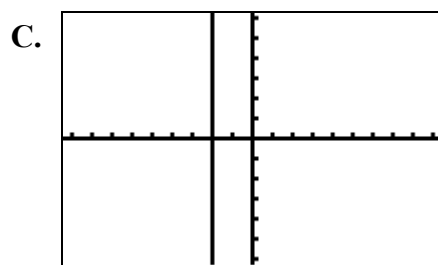
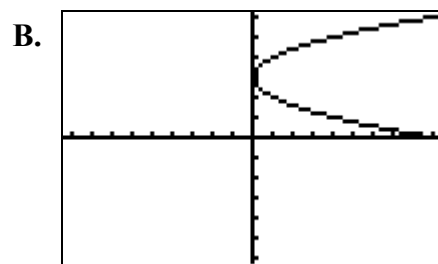
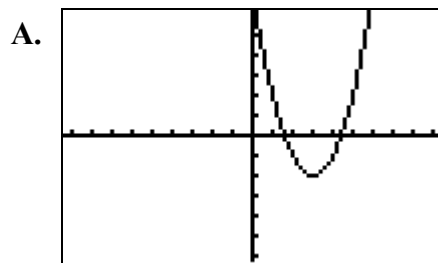
Input	Output
-1	2
0	2
1	3
5	3

IV.

Input	Output
-4	3
0	1
2	12
4	7

- A. II only
- B. I and IV only
- C. III and IV only
- D. I, III, and IV only

14. Which graph below represents a function?



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15. Which input-output table represents the function  $f(x) = 5x - 4$ ?

A. 

Input	Output
2	-10
3	-5
6	10
8	20

B. 

Input	Output
2	6
3	11
6	16
8	21

C. 

Input	Output
2	6
3	11
6	26
8	36

D. 

Input	Output
2	14
3	19
6	34
8	44

16. For  $f(x) = -2x^2 + 4x - 1$ , what is  $f(3)$ ?

- A. -29
- B. -7
- C. -1
- D. 17

17. Translate the table into words:

<b>Input</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Output</b>	<b>5</b>	<b>7</b>	<b>9</b>	<b>11</b>	<b>13</b>

- A. The output is four less than triple the input.
- B. The output is one less than double the input.
- C. The output is one greater than double the input.
- D. The output is two greater than the input.

18. Which sentence represents the equation  $y = 2x + 5$ , where  $y$  represents Karla's age and  $x$  represents the age of her cousin?

- A. Karla's age is 2 years older than 5 times the age of her cousin.
- B. Karla's age is 2 years younger than 5 times the age of her cousin.
- C. Karla's age is 5 years older than twice the age of her cousin.
- D. Karla's age is 5 years younger than twice the age of her cousin.

19. What is the domain of the following function?  $\{(-3, 1), (-2, 7), (4, 2), (2, 5)\}$

- A.  $\{-3 \leq x \leq 4\}$
- B.  $\{1 \leq x \leq 7\}$
- C.  $\{1, 2, 5, 7\}$
- D.  $\{-3, -2, 2, 4\}$

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20. Solve the equation  $64 = 3x + 22$  for  $x$ .

- A.  $x = 14$
- B.  $x = 21.33$
- C.  $x = 24$
- D.  $x = 28.67$

21. Solve  $4x - 2 + 5x = -29$  for  $x$ .

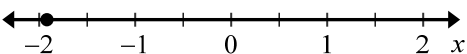
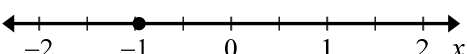
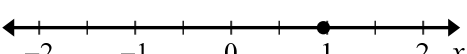
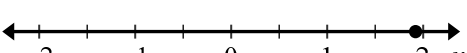
- A.  $-27$
- B.  $-3$
- C.  $3$
- D.  $27$

22. Solve the equation

$$4(3x - 4) + 2 = -2(-6x + 1) \text{ for } x.$$

- A.  $x = \frac{2}{3}$
- B.  $x = 1$
- C. No solution
- D. Infinitely many solutions

23. Which graph represents the solution of  $2.5x + 1.2 = -3.6$ ?

- A. 
- B. 
- C. 
- D. 

24. Solve the equation  $A = 2\pi rh + 2\pi r^2$  for the variable  $h$ .

- A.  $h = A - 4\pi r^2$
- B.  $h = A - r$
- C.  $h = \frac{A - \pi r^2}{\pi r}$
- D.  $h = \frac{A - 2\pi r^2}{2\pi r}$

25. Hope uses the equation  $C = 3h + 9$  to find the total cost,  $C$ , in dollars, of renting a bike for  $h$  hours. Hope cannot spend more than \$30. What is the maximum number of hours she can rent the bike?

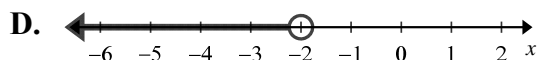
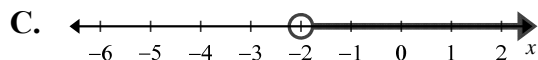
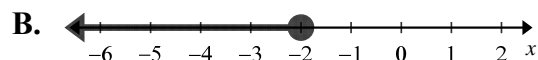
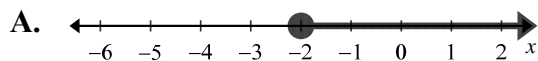
- A. 7
- B. 10
- C. 13
- D. 18

26. The number of cars in the student parking lot is 384, which is 12 more than 3 times the number of cars in the teacher parking lot. How many cars are in the teacher parking lot?

- A. 124
- B. 132
- C. 348
- D. 372

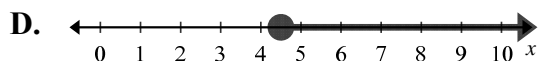
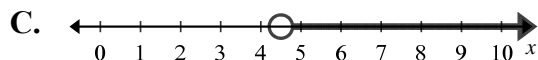
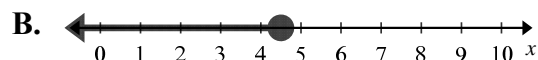
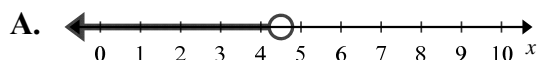
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27. Which graph below illustrates the inequality  $x \leq -2$ ?



28. Graph the solution to the inequality:

$$4x - 3 \geq 2(x + 3).$$



29. What is the solution set of  $|8x - 3| = 13$ ?

A.  $\left\{-2, \frac{5}{4}\right\}$

B.  $\left\{-\frac{5}{4}, 2\right\}$

C.  $\left\{\frac{5}{4}\right\}$

D.  $\{2\}$

30. Solve the compound inequality:

$$6n - 5 < -35 \text{ or } -10n + 1 < -59.$$

A.  $-6 < n < 5$

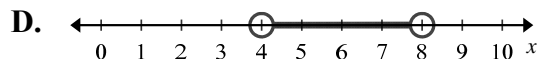
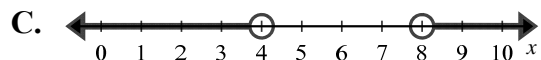
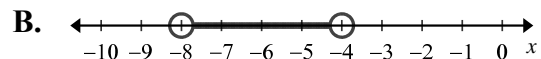
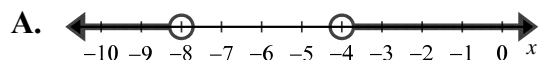
B.  $-5 < n < 6$

C.  $n < -5$  or  $n > 6$

D.  $n < -6$  or  $n > 5$

31. Which graph below represents the solution to the inequality below?

$$-38 < 10 - 6k < -14$$



32. Solve the inequality below for  $x$ :

$$|3x - 5| < 6$$

A.  $x < -\frac{11}{3}$  or  $x > \frac{1}{3}$

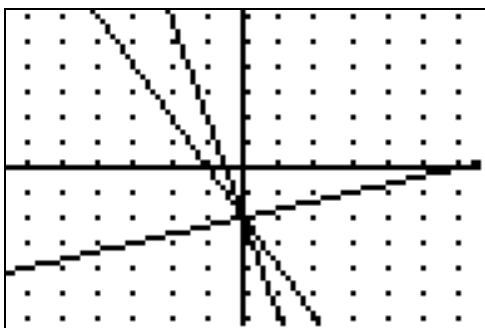
B.  $-\frac{11}{3} < x < \frac{1}{3}$

C.  $x < -\frac{1}{3}$  or  $x > \frac{11}{3}$

D.  $-\frac{1}{3} < x < \frac{11}{3}$

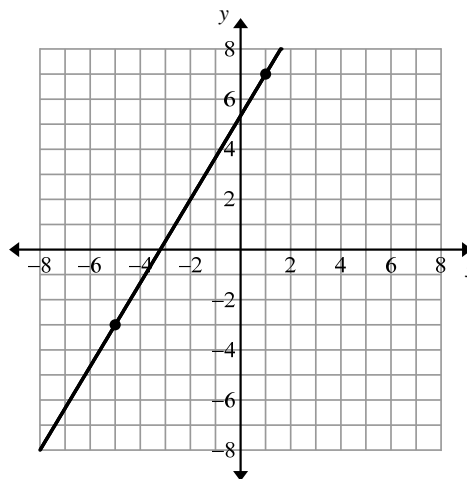
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33. What do the following lines have in common?



- A. They have the same  $x$ -intercept.  
 B. They have the same  $y$ -intercept.  
 C. They have the same slope.  
 D. They are the same function.
34. Which statement about the comparison between the graphs of  $y = 2x - 1$  and  $y = 5x - 1$  is correct?
- A. The graph of  $y = 5x - 1$  is steeper than the graph of  $y = 2x - 1$   
 B. The graph of  $y = 5x - 1$  is less steep than the graph of  $y = 2x - 1$   
 C. The graph of  $y = 5x - 1$  is shifted 3 units up from the graph of  $y = 2x - 1$   
 D. The graph of  $y = 5x - 1$  is shifted 3 units down from the graph of  $y = 2x - 1$

35. Find the slope of the line in the graph.



- A.  $\frac{3}{5}$   
 B.  $\frac{2}{3}$   
 C.  $\frac{3}{2}$   
 D.  $\frac{5}{3}$
36. What is the slope of the line that passes through the points  $(4, 6)$  and  $(-4, 9)$ ?
- A.  $-\frac{3}{8}$   
 B. 0  
 C.  $-\frac{8}{3}$   
 D. Undefined

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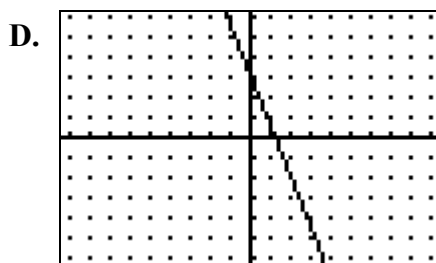
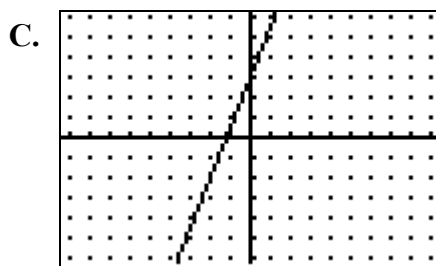
37. What is the slope of the line that passes through the points  $(3, -1)$  and  $(5, -1)$ ?

- A. 0
- B. 2
- C.  $-2$
- D. undefined

38. What are the intercepts of the graph of the equation  $5x + 4y = 12$ ?

- A.  $x$ -intercept =  $\frac{12}{5}$ ,  $y$ -intercept = 4
- B.  $x$ -intercept = 5,  $y$ -intercept = 4
- C.  $x$ -intercept =  $\frac{12}{5}$ ,  $y$ -intercept = 3
- D.  $x$ -intercept = 5,  $y$ -intercept = 3

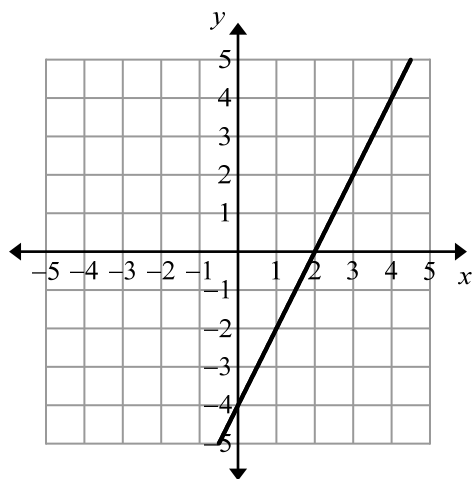
39. Which graph best represents the equation  $y = \frac{2}{5}x + 3$ ? (Assume the scales on both axes are one unit per tick mark.)





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40. Use the graph below.



What is the equation of the line in the graph?

- A.  $-2x - 4y = 8$
- B.  $-4x + 2y = 8$
- C.  $2x - 4y = 8$
- D.  $4x - 2y = 8$

41. Rewrite the following equation in standard form:

$$y - 8 = \frac{1}{2}(x + 6)$$

- A.  $x - 2y = -11$
- B.  $x - 2y = -14$
- C.  $x - 2y = -22$
- D.  $2x - 2y = -28$

42. Rewrite the following equation in slope-intercept form:

$$6x - 7y = -84$$

- A.  $y = \frac{6}{7}x + 12$
- B.  $y = \frac{6}{7}x - 12$
- C.  $y = -\frac{6}{7} + 12$
- D.  $y = -\frac{6}{7} - 12$

43. Which equation below, in point-slope form, represents the line that passes through the point  $(-1, 2)$  with a slope of 3?

- A.  $y - 1 = 3(x + 2)$
- B.  $y + 1 = 3(x - 2)$
- C.  $y - 2 = 3(x + 1)$
- D.  $y + 2 = 3(x - 1)$

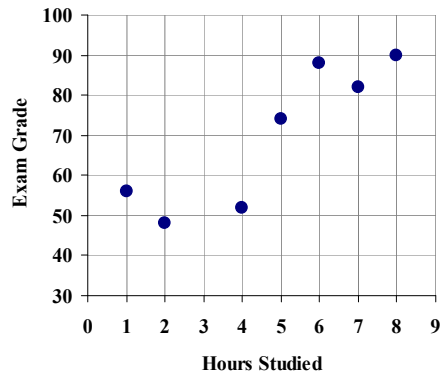
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44. What is the equation of the line in slope-intercept form passing through the points in the table?

$x$	-3	0	3	6	9
$y$	2.5	2	1.5	1	0.5

- A.  $y = -\frac{1}{6}x + 2$
- B.  $y = -\frac{1}{6}x - 2$
- C.  $y = -\frac{1}{3}x - 2$
- D.  $y = -\frac{1}{3}x + 2$
45. Which line is parallel to the line  $y = 3x - 4$ ?
- A.  $y = 4x + 2$
- B.  $y = 3x + 2$
- C.  $y = -\frac{1}{3}x + 2$
- D.  $y = -\frac{1}{4}x + 2$
46. Which equation represents the line that contains the point (0,4) and is perpendicular to the line represented by  $y = 3x + 2$ ?
- A.  $y = 3x + 4$
- B.  $y = -\frac{1}{3}x + 4$
- C.  $y = 3x + 2$
- D.  $y = -\frac{1}{3}x + 2$

47. The scatterplot below shows the times seven students studied for their final exam and their grades on that exam.

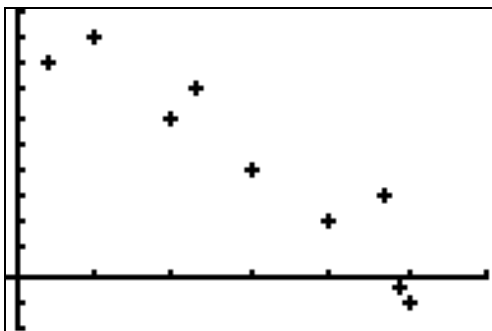


Based on a linear relationship between the variables, what is the best prediction of the final exam grade for a student who studies for 3 hours?

- A. 40
- B. 50
- C. 60
- D. 70

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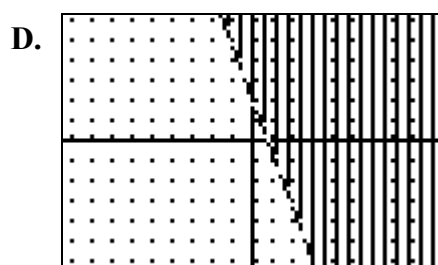
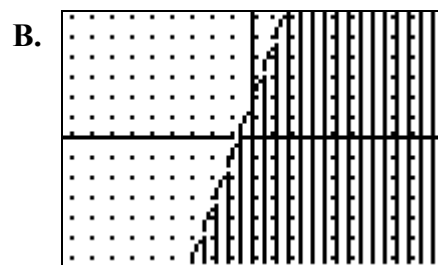
48. Use the scatterplot below. Assume the scales on each axis are one unit per tick mark.



Which of the equations would most accurately represent the line of best fit for the data?

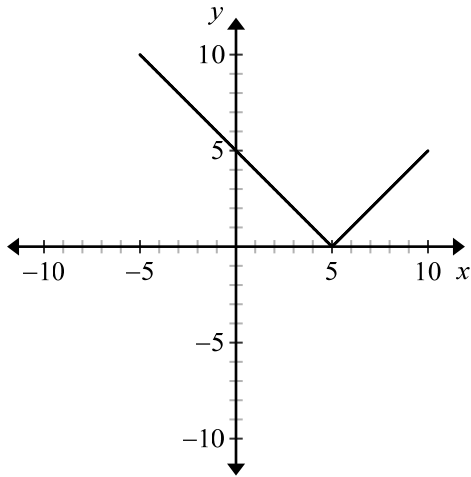
- A.  $y = -2x + 10$
- B.  $y = 2x + 10$
- C.  $y = -2x - 10$
- D.  $y = 2x - 10$

49. Which graph correctly represents  $-3y < 8x - 6$ ? (Assume the scales on both axes are one unit per tick mark.)



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50. Use the graph below.



What is the equation of the function?

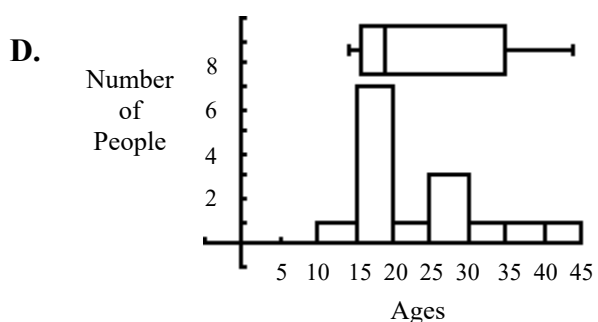
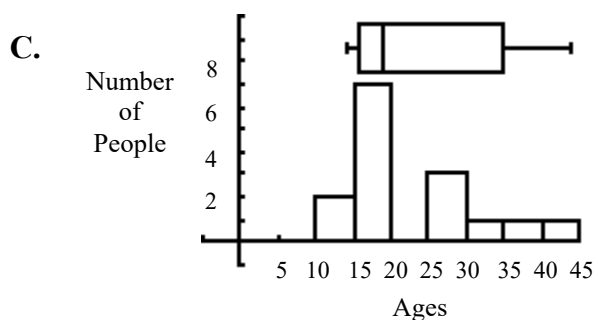
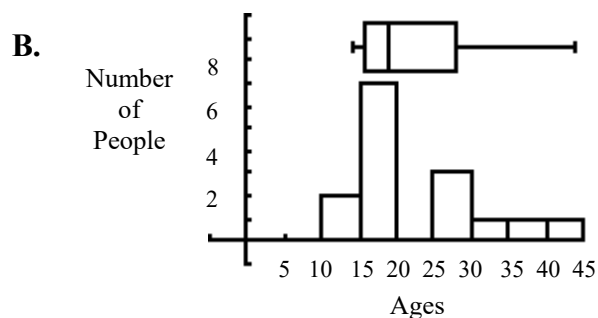
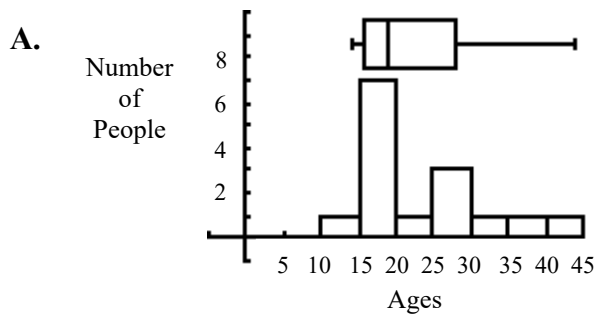
- A.  $y = |x| - 5$
- B.  $y = |x| + 5$
- C.  $y = |x - 5|$
- D.  $y = |x + 5|$

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51. The manager of a concert venue wrote down the ages of 15 people attending a concert in the table below.

14	16	16	16	17	18	18	19	21	26	26	28	32	39	44
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Which box-and-whisker plot and histogram matches those ages (shown above)?



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52. George has \$36 to spend on fruit for a party. Strawberries cost \$1.50 per pound and grapes cost \$2.00 per pound. Let  $s$  represent the number of pounds of strawberries and  $g$  represent the pounds of grapes George can buy. Which inequality describes the situation?
- A.  $1.50s + 2.00g \geq 36.00$   
B.  $1.50g + 2.00s \geq 36.00$   
C.  $1.50s + 2.00g \leq 36.00$   
D.  $1.50g + 2.00s \leq 36.00$
53. How many solutions does the equation  $-3x + 5x + 5 = -7x - (-9x - 5)$  have?
- A. No real solution (empty set)  
B. One solution  
C. Two solutions  
D. Infinitely many solutions (identity)
54. What is the value of  $t$  in the equation  $4(1 - x) + tx = -2(x + 1)$  when  $x = -6$ ?
- A.  $-5$   
B.  $-3$   
C.  $1$   
D.  $3$
55. The formula for the area of a trapezoid is  $A = \frac{1}{2}h(b_1 + b_2)$ . Which equation is equivalent to this formula?
- A.  $A = \frac{1}{2}hb_1 + b_2$   
B.  $h = \frac{2A}{b_1 + b_2}$   
C.  $h = \frac{A}{b_1 + b_2}$   
D.  $b_1 = 2A - b_2$
56. An electronics store sells about 670 CD players a year and about 220 MP3 players a year. The number of CD player sales decreased by 50 each year and the number of MP3 player sales increased by 40 each year. How many years will it take for MP3 player sales to be twice as much as the CD player sales?
- A. 1  
B. 3  
C. 5  
D. 8
57. Charles has \$280 in his savings account and saves \$10 more each week. His brother, Raymond, has \$405 in his savings account and spends \$15 of his savings each week. In how many weeks will Charles and Raymond have the same amount in their savings accounts?
- A. 28  
B. 25  
C. 5  
D. 3

## Algebra I H Semester 1 Practice Exam

58. Using the slope of the line  $5x + 3y + 9 = 0$ , what steps could be used to move from one point on the line to another point on the line?

- A. 5 units up, 3 units to the right
- B. 5 units down, 3 units to the right
- C. 3 units up, 5 units to the left
- D. 3 units down, 5 units to the left

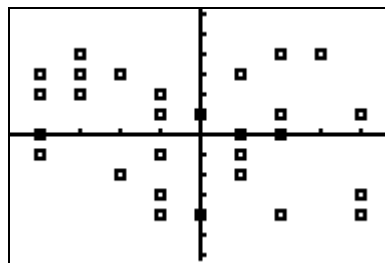
59. Samantha filled a hot tub with water. When she started, the hot tub already had 70 gallons of water. The table shows the number of gallons of water in the hot tub after filling it for  $h$  hours.

Number of hours ( $h$ )	Number of Gallons ( $g$ )
0	70
1	400
2	730
3	1,060
4	1,390

Which equation should be used to determine the number of gallons in the pool after  $h$  hours?

- A.  $g = 330h$
- B.  $g = 70h$
- C.  $g = 70h + 330$
- D.  $g = 330h + 70$

60. Which is the BEST description of the scatterplot below?



- A. The variables have little or no correlation.
- B. The variables have a positive correlation.
- C. The variables have a negative correlation.
- D. The variables show interpolation.

**Algebra I H Semester 1 Practice Exam  
Free Response**

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1. Justify each step used to solve the algebraic equation  $4 - 10x = 5x + 2(3x - 5)$ .

List each step

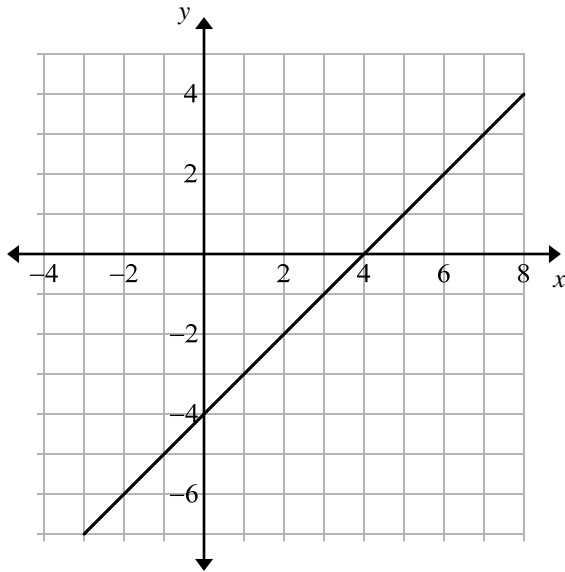
Justification for each step



## Algebra I H Semester 1 Practice Exam Free Response

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2. Use the following graph to answer the questions below.



A. Complete the table of values below:

$x$	-2	1	4	7
$y$				

B. According to the table and graph above, is this relation a function? Justify your answer.

C. Model the graph with a linear equation in function notation.

**Algebra I H Semester 1 Practice Exam  
Free Response**

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3. Sam rented a moving truck for a \$45.00 fee and an additional \$0.35 per mile driven.

A. Write a linear equation to model the cost ( $C$ ) for the number of miles driven ( $m$ ).

B. Sam paid \$59.00 when he returned the truck. How many miles did he drive?

C. How would the graph of the cost equation from Part A look different from the graph of  $C = 0.7m + 55$ ? What would this mean in the context of the rental truck problem?

