



My child has completed this entire assignment by Sunday night.

Guardian Signature _____

25

Part I. Answer 11 questions in this part. Each correct answer will receive 1 credit. For each question, all necessary work should be shown to the right side of the problem. All questions marked *W* require appropriate work to be shown or no credit will be given- even if a correct answer is provided. [11]

| | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|-----|-----|
| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. |
|----|----|----|----|----|----|----|----|----|-----|-----|

1. Which domain would be the most appropriate set to use for a function that predicts the number of household online-devices in terms of the number of people in the household?

(1) whole numbers (2) integers (3) irrational numbers (4) rational numbers

- W2.** Which formula can be used to find the *n*th term of sequence *B* shown below?

$$B = 10, 12, 14, 16, \dots$$

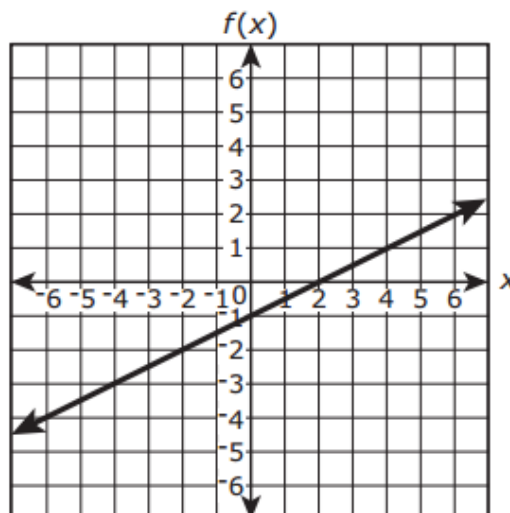
(1) $b_n = 8 + 2n$ (2) $b_n = 10 + 2n$

(3) $b_n = 10(2)^n$ (4) $b_n = 10(2)^{n-1}$

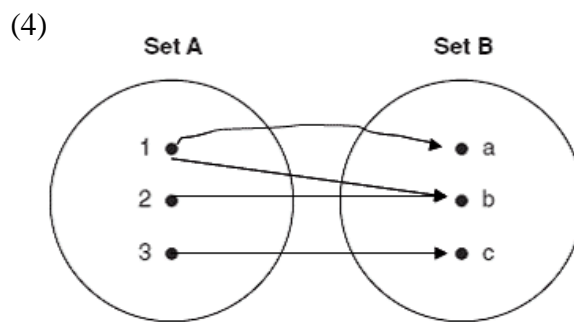
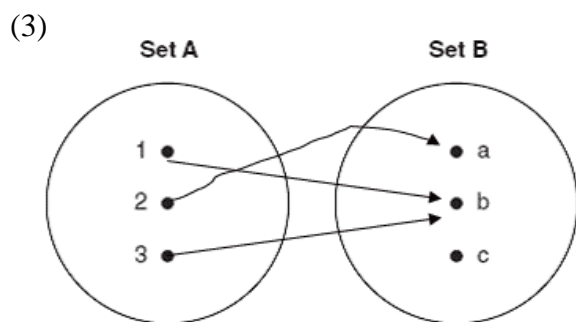
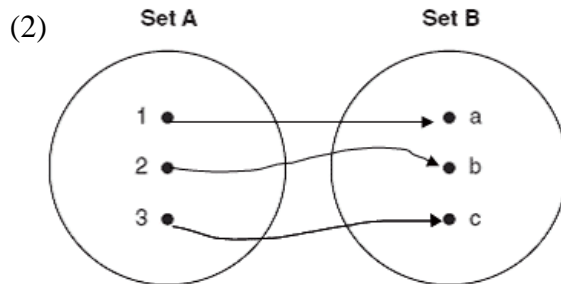
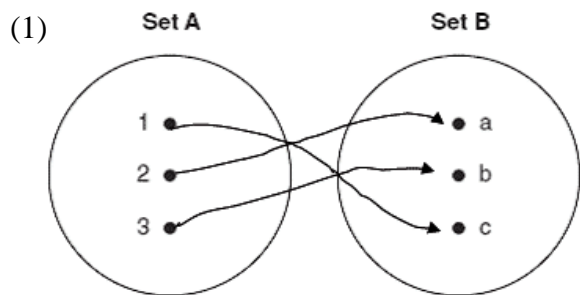
3. The graph of the function $f(x) = -1 + 0.5x$ is shown on the coordinate plane. For what value of x does $f(x) = 0$?

(1) -1 (2) 2

(3) 0 (4) -2



4. Which of the following diagrams shows a mapping of a relation from Set A to set B that is *not* a function?



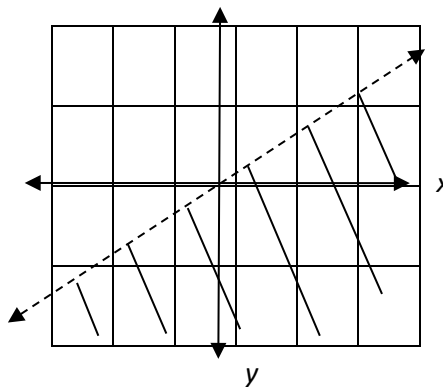
W5. Which inequality is represented by the accompanying graph?

(1) $y \leq \frac{1}{2}x$

(2) $y < -\frac{1}{2}x$

(3) $-2y > -x$

(4) $2y < -x$



6. The cost to manufacture x pairs of sunglasses can be represented by a function $C(x)$. If it costs \$398 to manufacture 4 pairs of sunglasses, which of the following is true?

(1) $C(4) = 99.50$

(2) $C(398) = 4$

(3) $C(4) = 398$

(4) $C(99.50) = 1$

W7. If a sequence is defined recursively as $f(0) = 3$ and $f(n + 1) = -4f(n) + 1$, then $f(2)$ is equal to

(1) -11

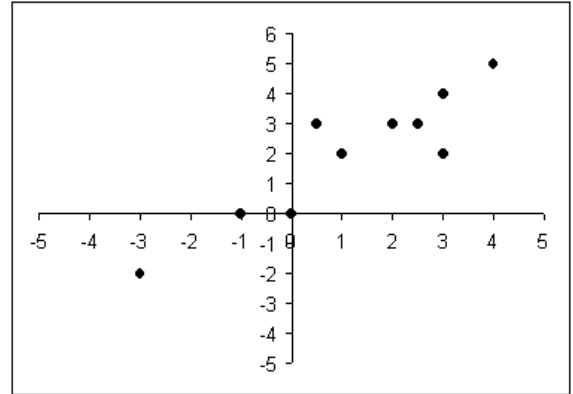
(2) 45

(3) 1

(4) -7

8. The graph shows a scatter plot of data in the x - y coordinate plane. Which of the following best represents the equation of the line of best fit for the data in the graph?

- (1) $y = x + 2$ (2) $y = -x + 1$
 (3) $y = 2x + 1$ (4) $y = x + 1$



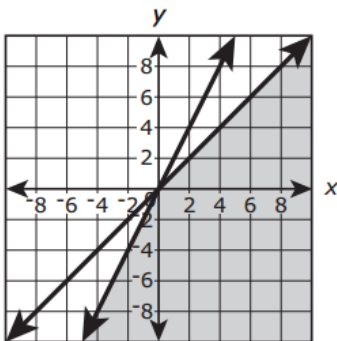
9. The cost of airing a commercial on television is modeled by the function $C(n) = 110n + 900$, where n is the number of times the commercial is aired. Based on this model, which statement is true?

- (1) The commercial costs \$0 to produce and \$110 per airing up to \$900.
 (2) The commercial costs \$110 to produce and \$900 each time it is aired.
 (3) The commercial costs \$900 to produce and \$110 each time it is aired.
 (4) The commercial costs \$1010 to produce and can air an unlimited number of times.

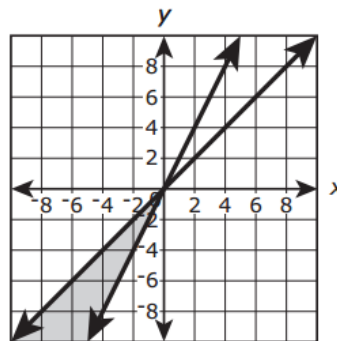
W10. Which graph best represents the solution to the system of inequalities?

$$\begin{aligned} x + y &\leq 6 \\ x + 2y &\leq 8 \end{aligned}$$

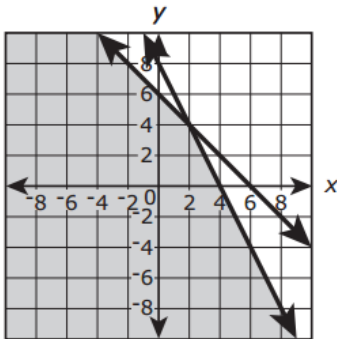
(1)



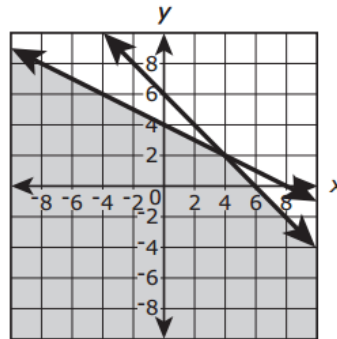
(2)



(3)



(4)



W11. A soccer club holds a fundraiser that sold drinks (d) and snacks (s) to a number of people (p). The equation $q = \frac{d+s}{p}$ indicates the average amount of money that was spent by each person. What is s expressed in terms of q , d and p ?

(1) $\frac{q}{p} - d$

(2) $q - \frac{d}{p}$

(3) $qp + d$

(4) $qp - d$

Part II. Answer all questions in this part. Each correct answer will receive 2 credits. Clearly indicate all necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [6]

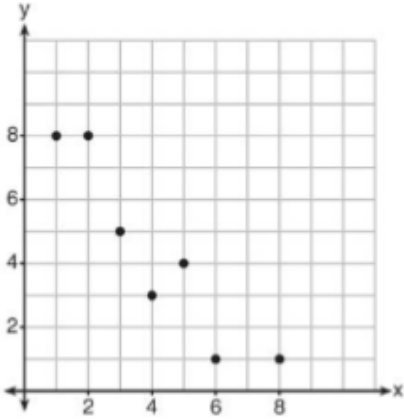
12. The cost of a bottle of lemonade in a vending machine is \$1.50. The cost of a pack of chewing gum is \$0.50 in the same machine. Meredith has \$25 to spend on bottles of lemonade and chewing gum for her tennis team. If she decides to buy 10 packs of chewing gum and b represents the number of bottles of lemonade she is going to purchase, write an **inequality** statement to determine the maximum number of bottles she can buy. Solve your inequality and find the maximum number of bottles of lemonade she can purchase.

13. Let f and g be the functions given by $f(x) = x^2$ and $g(x) = x(15 - x)$.

a. True/False: $f(7) > g(7)$ Justify your response.

b. Evaluate $f(-3) + g(6)$

14. What is the correlation coefficient of the linear fit of the data shown below, to the *nearest hundredth*? Explain the meaning of this number as it relates to the data.



Part III. Answer both questions in this part. Each correct answer will receive 4 credits. Clearly indicate all necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [8]

15.

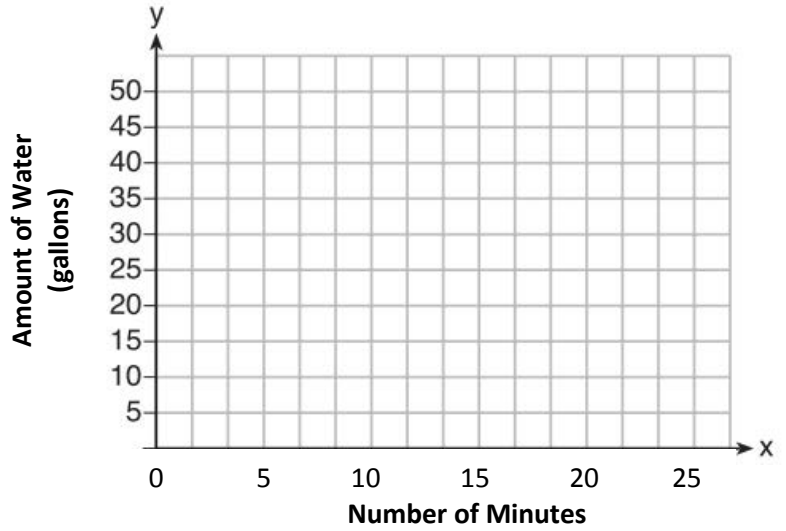
Two utility companies sell electricity in units of kilowatt-hours. The cost of electricity for company P is shown in the table. The cost of electricity for company M can be found by using the equation shown, where y represents the total cost in dollars for x kilowatt-hours of electricity. Which company is less expensive if a consumer is planning on purchasing 2,375 kilowatt-hours? Justify your response.

| Electricity Costs | | |
|--------------------------|----------------------|-------------|
| Company P | | Company M |
| Number of Kilowatt-hours | Total Cost (dollars) | $y = 0.15x$ |
| 1,250 | 150.00 | |
| 1,650 | 198.00 | |

16. An outdoor shower head connected to a mechanism that contains 45 gallons of water releases 1.8 gallons of water per minute. The function $V(x) = 45 - 1.8x$ represents the amount of water remaining after x minutes.

a. Complete the table of values below that models this situation and graph the function.

| x | $V(x)$ |
|-----|--------|
| 0 | |
| 5 | |
| 10 | |
| 15 | |
| 20 | |
| 25 | |



b. Identify the **y-intercept**. Explain its meaning in the context of this situation.

c. Identify the **x-intercept**. Explain its meaning in the context of this situation.