

Mathematics, Grade 8 – Scoring Guide

**G1A8**

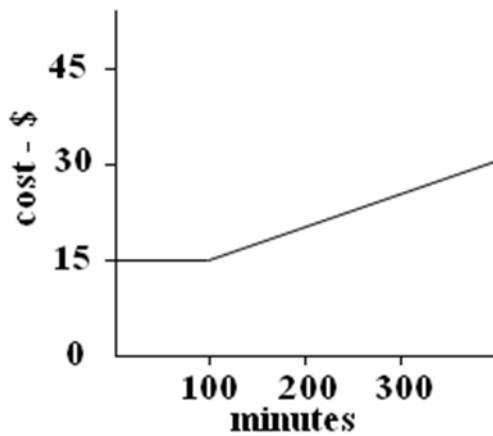
Two sides of a triangle measure 5 and 12. Which is *not* true?

- A. A right triangle having these two sides can be formed.
- B. A non-right triangle having these two sides can be formed.
- C. It is possible to form a triangle having these two sides if the triangle's longest side measures 18. \*
- D. It is possible to form a triangle having these two sides if the triangle's longest side measures 12.

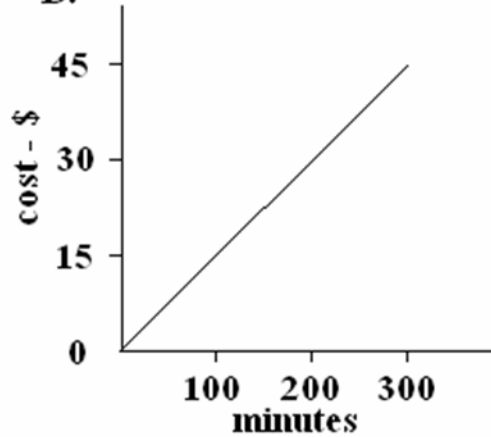
**D1C8**

A particular cell phone plan costs \$15 per month plus 5 cents per minute for each minute of calling time beyond 100 minutes per month. Select the graph that represents this situation.

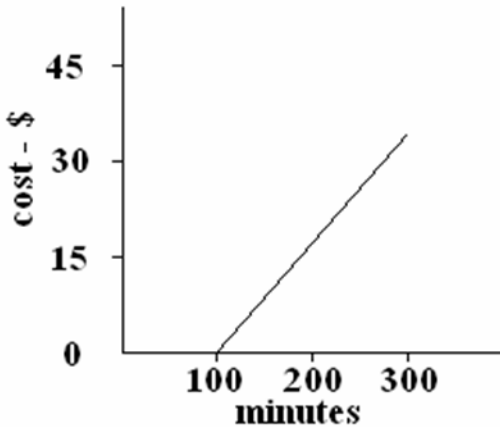
\* **A.**



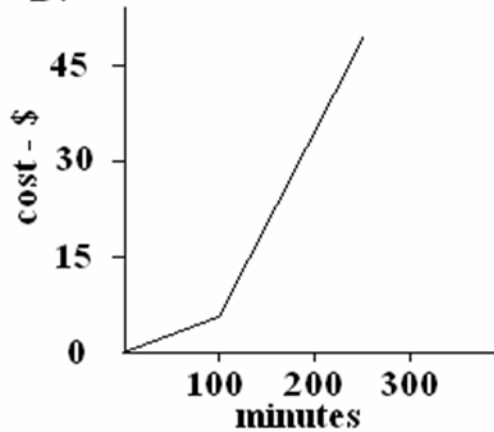
**B.**



**C.**



**D.**



**A3A8**

In a particular triangle, one side is twice the length of the shortest side. The third side of the triangle is 4 inches longer than the shortest side. Which equation represents the perimeter of this triangle if  $n$  is the length of the shortest side in inches?

- A. perimeter =  $n + 2n + 2n + 4$
- B. perimeter =  $n + 2n + n + 4$  \*
- C. perimeter =  $n + 2 + 2n + 4n$
- D. perimeter =  $n + 2n + 4n$

**A4A8**

Webster found this equation and table in his algebra book:

$$y = 2x + 3$$

$x$	$y$
1	5
2	7
3	9
4	11

What are the  $y$ -intercept and slope of the line represented by this data?

- A.  $y$ -intercept = 0; slope = 2
- B.  $y$ -intercept = 3; slope = 1
- C.  $y$ -intercept = 2; slope = 3
- D.  $y$ -intercept = 3; slope = 2 \*

**A2A8**

A plumber charges a \$25 service fee plus \$39.50 per hour to work on plumbing in a house. Which equation represents the total cost,  $C$ , for the plumber's service if he works  $h$  hours?

- A.  $C = 39.50 + 25h$
- B.  $h = 39.50C + 25$
- C.  $C = 64.50h$
- D.  $C = 25 + 39.50h$  \*

**G3C8**

Which statement is *not* true?

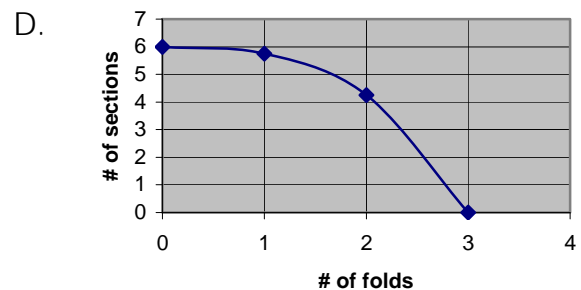
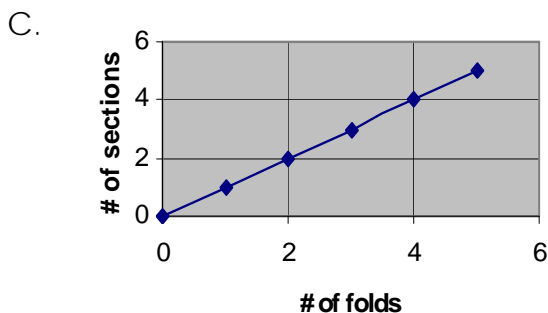
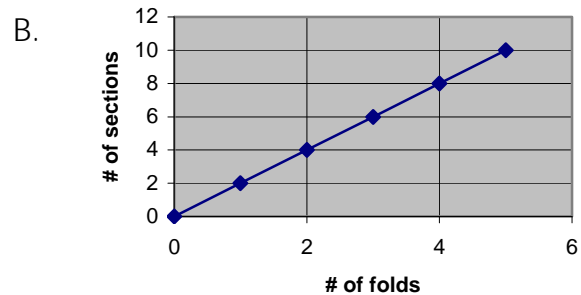
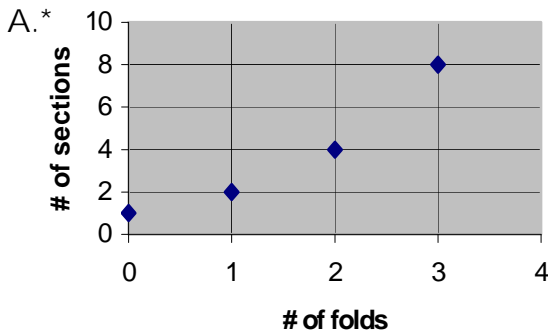
- A. A square has more rotational symmetries than an equilateral triangle.
- B. A square has more rotational symmetries than a non-square rectangle.
- C. A square has more rotational symmetries than a regular hexagon. \*
- D. A square has as many rotational symmetries as it has lines of symmetry.

**A1B3**

A math class studying patterns conducted a paper folding experiment. Students folded a piece of paper in half and noted how many sections resulted from the fold. They continued folding the paper in half, noting the number of sections that resulted from each new fold, and compiled their data in this chart:

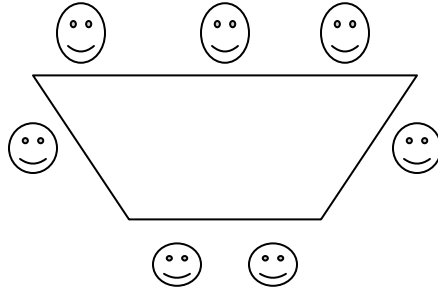
Number of folds	0	1	2	3
Number of sections	1	2	4	8

Which graph shows the correct pattern for this experiment?

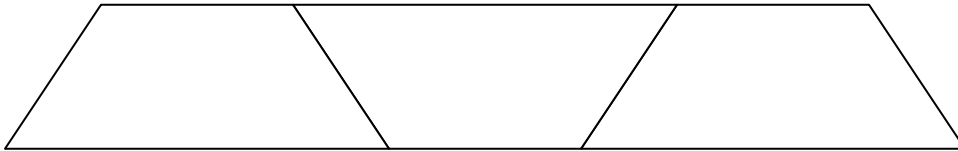


**A1B8**

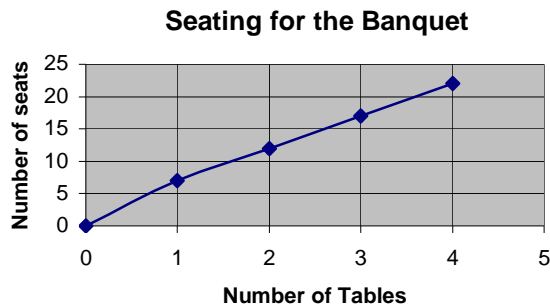
The tennis team is planning its annual banquet. The tables in the room are trapezoids. Each table can seat 7 people, as shown.



However, the team plans to place the tables end-to-end, as shown:



The graph shows the number of people who can be seated within this table arrangement when using different numbers of tables:



Which most accurately describes the pattern shown in the graph?

- A. Multiply the number of tables by 7 to get the number of seats.
- B.\* If  $T$  = the number of tables and  $S$  = total seats, then  $S = 2 + 5T$ .
- C. If  $T$  = the number of tables and  $S$  = total seats, then  $S = T + 5$ .
- D. Multiply the number of tables by 6, and then add 7 to that total.

**A2B8**

How many of these expressions are equivalent to  $3a + 6$ ?

$$2a + 4 + a + 2 \quad 3(a + 6) \quad (a)(a)(a) + (2)(3) \quad 6a + 3$$

- A. 0
- B. 1 \*
- C. 2
- D. 3

**A3A8**

A special pizza deal allows you to buy the first pizza for \$12 and then every additional pizza for \$6. Write an equation to represent the cost  $c$  of  $n$  pizzas? Explain your answer.

Equation: \_\_\_\_\_

Exemplary response –  $c = 6 + 6n$ , **or**  $c = 12 + 6(n - 1)$ ;  $n$  = the number of pizzas, 6 = the increase in cost of additional pizzas after the first one, and  $c$  = the total cost

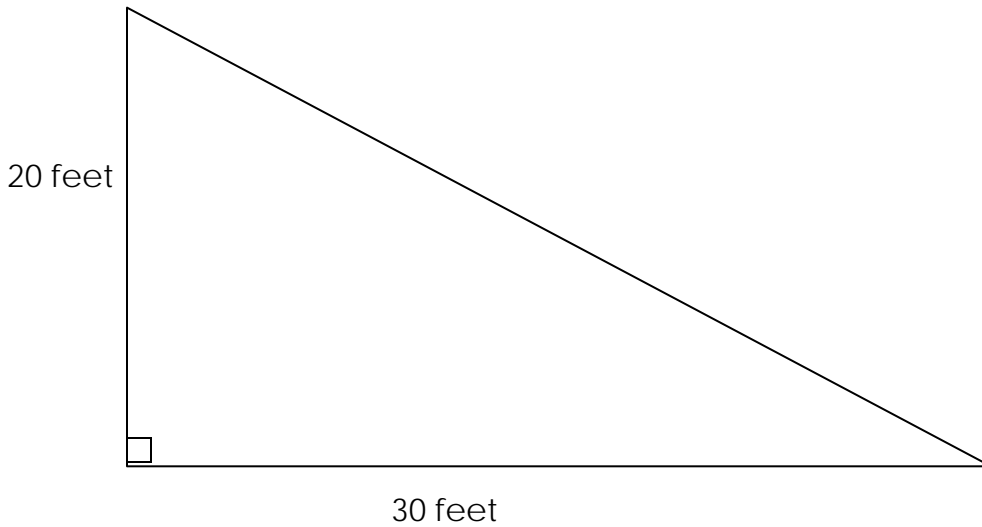
Scoring Guide:

- 2 points – a correct equation **and** a correct explanation
- 1 point – a correct equation **or** a correct explanation
- 0 points - other

**G1A8**

In the video game *Pythagoras and the Incline of Doom*, the character named Hypasus is trying to go up the dangerous incline. In this game, each character wears a power belt that contains power points. Each power point that the character has allows him to move up one foot on the incline. At this point in the game, he is at the bottom of the incline.

How many power points does Hypasus need to get all the way up the incline? Use the Pythagorean Theorem to help you reach your conclusion.



Show your work that supports your answer.

Number of Power Points Hypasus needs: \_\_\_\_\_

Exemplary response – The incline is 36.055 feet long, so Hypasus needs at least 37 power points;  $a^2 + b^2 = c^2$ ;  $20^2 + 30^2 = c^2$ ;  $400 + 900 = c^2$ ;  $c = \text{square root of } 1300 = 36.055$

Scoring Guide:

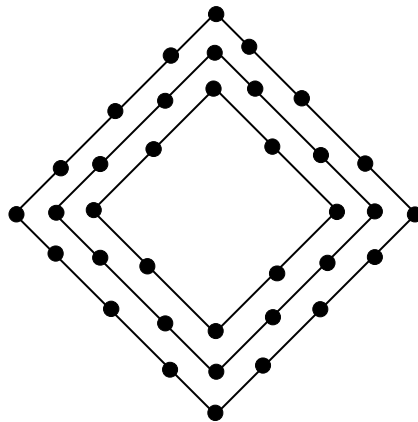
2 points – a correct answer **and** work to support the answer is shown

1 point – a correct answer **or** work to support the answer is shown

0 points - other

**A1B8**

The school marching band has a maneuver for its half-time show that uses a diamond formation. Mr. Kim, the band leader, sketched this diagram to show the band what the formation will look like on the field. Each dot represents one student.



Starting with the innermost diamond, Mr. Kim labeled them diamond 1, diamond 2, diamond 3, and so on.

Create a table or chart for the first 5 diamonds in the series that shows the number of students in each diamond.

Write an expression that will give the number of students in any number of diamonds.

Exemplary response: Correctly completed table and expression of  $4n + 4$

Diamond number	Number of students in that diamond
1	8
2	12
3	16
4	20
5	24

Scoring Guide:

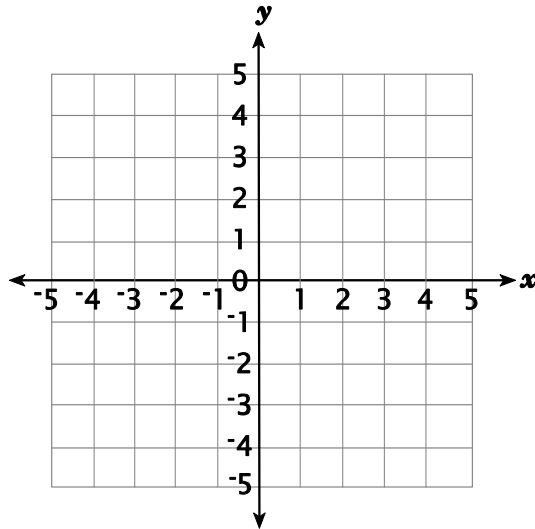
2 points – a correct completed table for diamonds 1 through 5 **and** a correct expression

1 point – a correct table **or** a correct expression

0 points - other

**G2A8**

Given that the points  $(1, 1)$  and  $(1, 5)$  are *corners* of a square, what two sets of coordinates could be graphed to form the other two corners of the square?



Corner: \_\_\_\_\_ Corner: \_\_\_\_\_

Exemplary response : Solutions for corners  $(5, 5)$   $(5, 1)$  and  $(-3, 1)$ ,  $(-3, 5)$ ;

**Scoring Guide**

- 2 points – Correctly identifies two pairs of coordinates that will form the corners
- 1 point – Correctly identifies one set of coordinates that will form the corners
- 0 points - other

**A1B8**

A. Look at the Input/Output table below. Use numbers or words to write a rule that states what happens to the number in the Input column to get the number in the Output column.

Input	Output
2	8
3	10
4	12
7	18

Rule:

B. Use your rule to find the Output if the Input is 100. Show your work.

Exemplary response:  $2x + 4$  or valid rule and Output number of 204.

Scoring Guide:

2 points – Correct rule **and** Output number of 2004.

1 point – Correct rule **or** Input number of 2004.

0 points - other

**G1B8**

Jamal had budgeted \$700 to carpet a cabin he was building. Then he decided that he could afford to build a cabin that was twice as long and twice as wide. Because the dimensions were now two times those originally planned, Jamal estimated that the carpet would cost twice as much.

When he went to buy the carpet, however, the price was **not** \$1,400. Explain Jamal's mistake **and** calculate the estimated cost of the carpet needed to cover his cabin.



Exemplary response – He made the mistake of doubling the amount of money he budgeted rather than multiplying it by four. Whenever the length and width are doubled it results in an area four times the area of the original figure. He should have multiplied  $\$700 \times 4$  to get \$2800.

Scoring Guide:

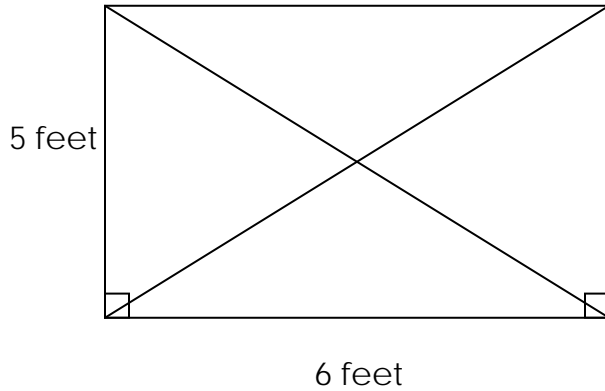
2 points – Correct explanation **and** correct estimate of \$2800.

1 point – Correct explanation **or** correct estimate of \$2800.

0 points - other

**G1A8**

Jason needs to nail two diagonal boards onto a 5' × 6' gate for reinforcement. How long of a board will he need to buy to be able to cut both boards for the reinforcement? Show the work that shows how you arrived at your answer.



Jason needs to purchase a board that is \_\_\_\_\_ feet long.

Exemplary response – Jason needs 7.8 ft for each diagonal board;  $a^2 + b^2 = c^2$  ;  $5^2 + 6^2 = c^2$  ;  $25 + 36 = c^2$  ;  $c = \text{square root of } 61 = 7.8$  . So he would need to buy a 16 foot board

Scoring Guide:

- 2 points – a correct answer **and** explanation using Pythagorean Theorem
- 1 point – a correct answer **or** correct explanation
- 0 points - other

**A1B8**

Perry's teacher put the following chart on the board:

Number of Banquet Tables	Perimeter of Figure Composed of These Tables
1	5
2	12
3	19
4	26
5	33

According to the pattern shown in the chart, what expression can be used to find the perimeter for any number of tables?

Expression: \_\_\_\_\_

What is the perimeter of a figure composed of 100 tables? \_\_\_\_\_

Exemplary response –  $7n - 2$ . A figure composed of 100 tables would have a perimeter of 698.

Scoring Guide:

2 points – Correct expression **and** perimeter of 698.

1 point – Correct expression **or** perimeter of 698.

0 points - other