2007

Green River

Regional Educational Cooperative

Grade 8

Mathematics

Measured Progress

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Note: Each item is aligned to a standard, but does not necessarily measure the entire standard.

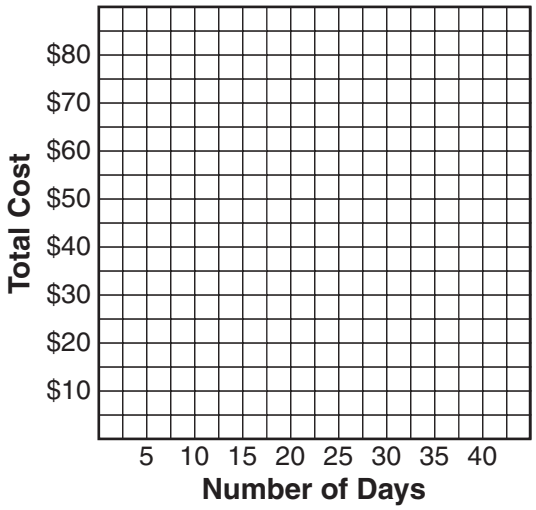
Item 1 Swimming Pass

Standard: MA-08-3.3.01: Coordinate Geometry – Students will identify and graph ordered pairs on a coordinate system; correctly identify the origin, axes, and ordered pairs; and will apply graphing in the coordinate system to solve real-world and mathematical problems.

Bloom's Taxonomy: a. Application
b. Knowledge
c. Knowledge
d. Analysis

Depth of Knowledge: Level 2

1. On the grid in your Student Response Booklet, copy the scales and labels shown below.



Haley wants to determine the cheapest way to pay for swimming at the local pool.

- A one-month pass of unlimited swimming costs $45.
- A one-day swimming pass costs $2.

Chart 1, on the following page, shows the cost of swimming using a one-month pass. Copy Chart 2 into your Student Response Booklet.

Chart 1

Number of Days of Actual Swimming	Cost Using One-Month Pass
10	$45
20	$45
30	$45

Chart 2

Number of Days of Actual Swimming	Cost Using One-Day Pass
10	
20	
30	

a. Complete Chart 2 to show the cost of swimming using **one-day** passes.

b. Plot the points from Chart 1 on the graph in your Student Response Booklet. Draw a line to show the cost of swimming different numbers of times using the one-month pass.

c. Plot the points from Chart 2 on the same graph. Draw a line to show the cost of swimming different numbers of times using one-day passes.

d. What is the **fewest** number of days that Haley would have to swim to make the one-month pass cheaper than buying one-day passes? Explain how you found your answer.

Swimming Pass

Scoring Guide

Score	Description
4	The student response demonstrates an exemplary understanding of the Geometry concepts involved in graphing ordered pairs and applying graphing in the coordinate system to solve real-world problems.
3	The student response demonstrates a good understanding of the Geometry concepts involved in graphing ordered pairs and applying graphing in the coordinate system to solve real-world problems. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is missing or flawed. As a result the response merits 3 points.
2	The student response demonstrates a fair understanding of the Geometry concepts involved in graphing ordered pairs and applying graphing in the coordinate system to solve real-world problems. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
1	The student response demonstrates a minimal understanding of the Geometry concepts involved in graphing ordered pairs and applying graphing in the coordinate system to solve real-world problems.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

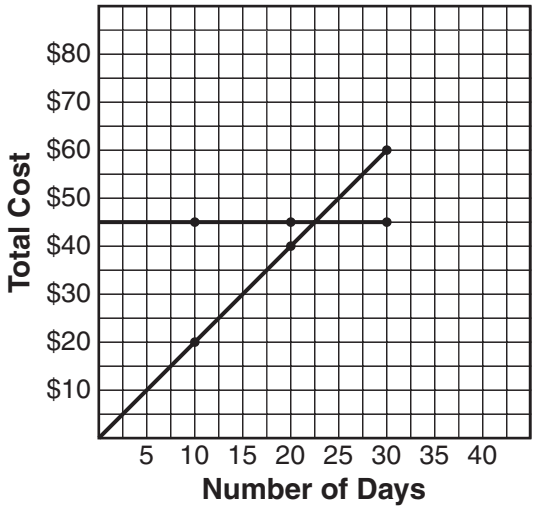
Sample Response:

Part a:

Chart 2

Number of Days of Actual Swimming	Cost Using One-Day Pass
10	$20
20	$40
30	$60

Parts b and c:



Part d: 22 one-day passes cost $44 but 23 one-day passes cost $46.

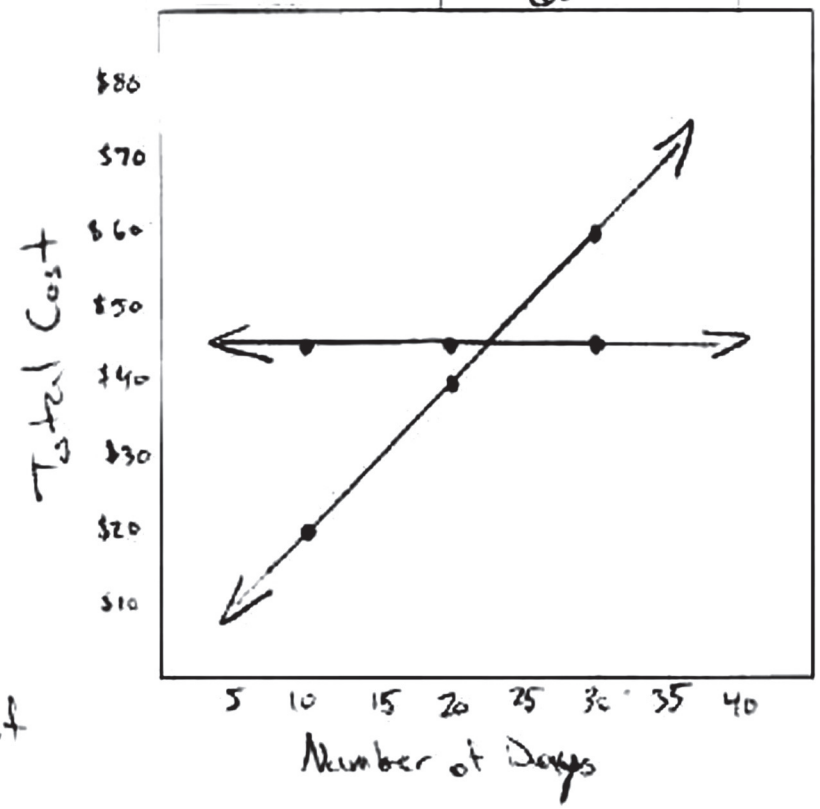
So the one-month pass is cheaper if she swims 23 days.

Sample Student Responses

Swimming Pass

A

# of Days of Actual Swimming	Cost Using One-Day Passes
10	20
20	40
30	60



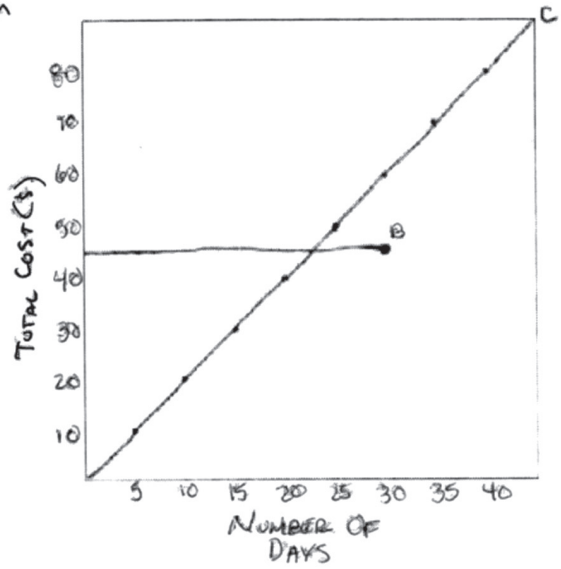
D. 23. I got 23 because for 23 days with an one-day pass it would cost $46. For a month pass it would cost $15. That is the fewest amount of days.

Score Point: 4

A)

Number of Days	Cost w/ One Day Pass
10	20
20	40
30	60

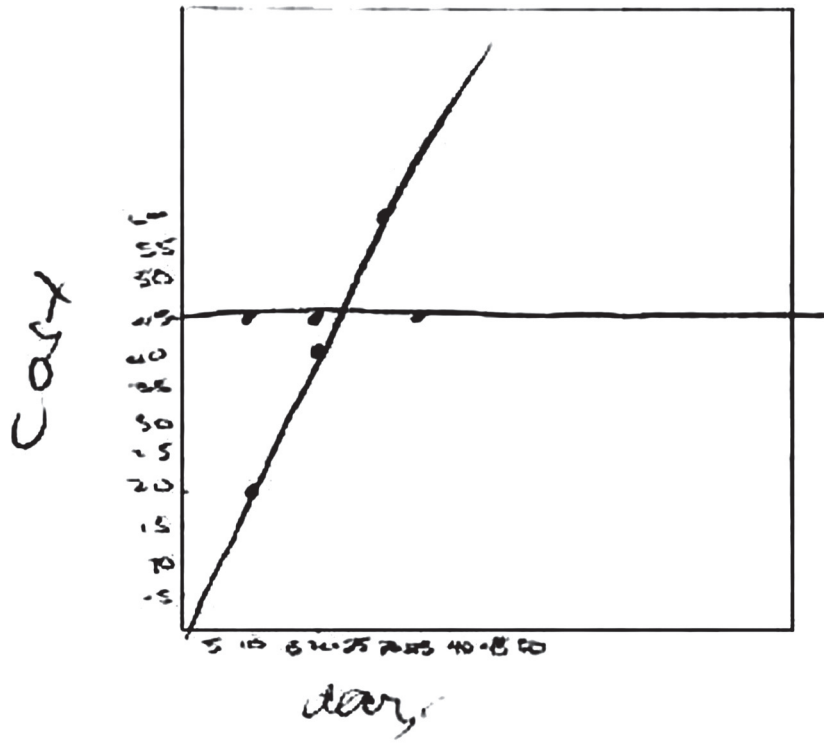
D) She would have to swim 23 days



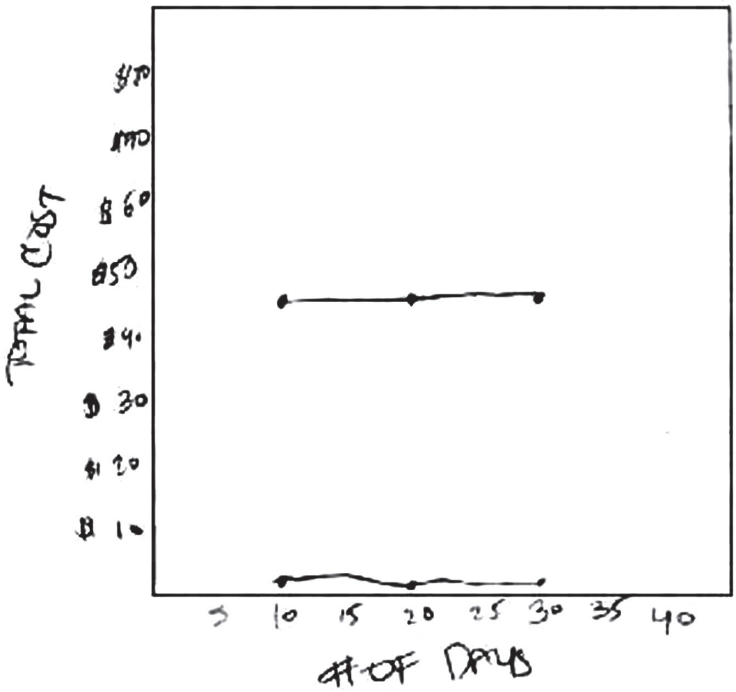
Score Point: 3

# of days swim	one day $
10	45
20	45
30	45

# days	$
10	20
20	40
30	60



Score Point: 2



Score Point: 1

Item 2 One-Day Bus Rental

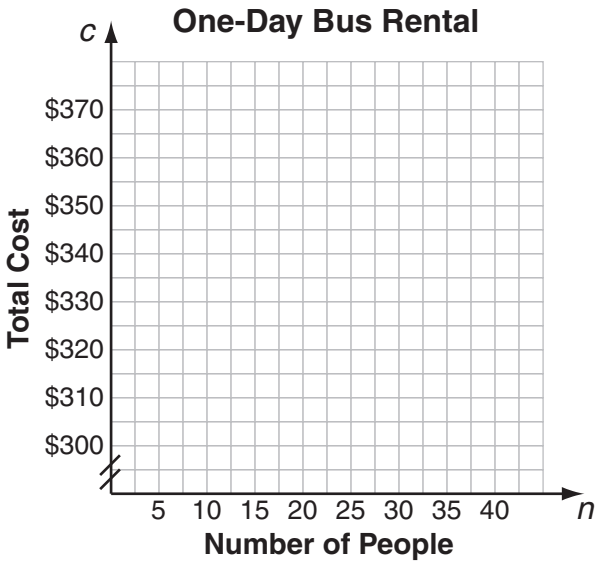
Standard: MA-08-5.1.02: Patterns, Relations, and Functions – Students will represent, analyze, and generalize simple first and second degree relationships using tables, graphs, words, and algebraic notations, and will apply the relationships to solve real-world and mathematical problems.

Bloom's Taxonomy: a. Knowledge
b. Comprehension
c. Knowledge

Depth of Knowledge: Level 2

2. Mr. Bennett's class is renting a bus for a field trip. The bus company charges $300 for a one-day rental plus $2 for each person who rides the bus.
   a. Create a table that shows the cost for a one-day rental when transporting the following groups of people:
      - a group of 10 people,
      - a group of 20 people, and
      - a group of 30 people.
   b. Write an equation that shows the relationship between the total cost, c, of a one-day bus rental and the number, n, of people transported.

   On the grid in your Student Response Booklet, copy the scales and labels shown below.



   c. Graph the equation you wrote in part b.

One-Day Bus Rental

Scoring Guide

Score	Description
4	The student response demonstrates an exemplary understanding of the concepts involved in representing a simple first-degree relationship using tables, graphs, and algebraic notations.
3	The student response demonstrates a good understanding of the concepts involved in representing a simple first-degree relationship using tables, graphs, and algebraic notations. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is missing or flawed. As a result the response merits 3 points.
2	The student response demonstrates a fair understanding of the concepts involved in representing a simple first-degree relationship using tables, graphs, and algebraic notations. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
1	The student response demonstrates a minimal understanding of the concepts involved in representing a simple first-degree relationship using tables, graphs, and algebraic notations.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

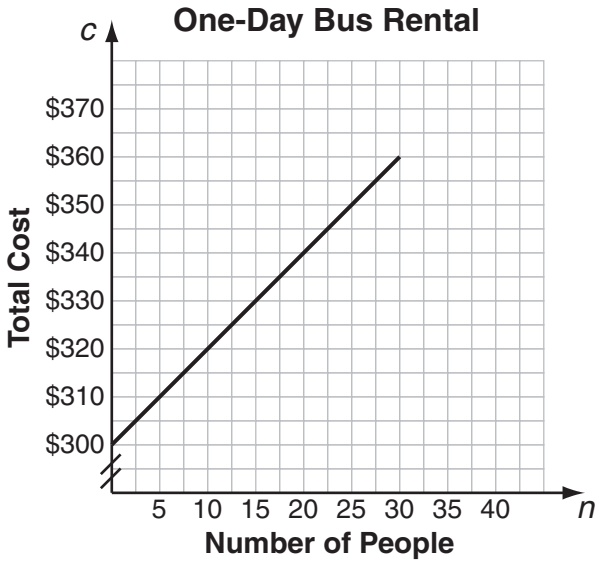
Sample Response:

Part a:

Group size	Cost
10	**$320**
20	**$340**
30	**$360**

Part b: $c = 2n + 300$

Part c:



Sample Student Responses

One-Day Bus Rental

EQUATION: $C = 300 + 2n$

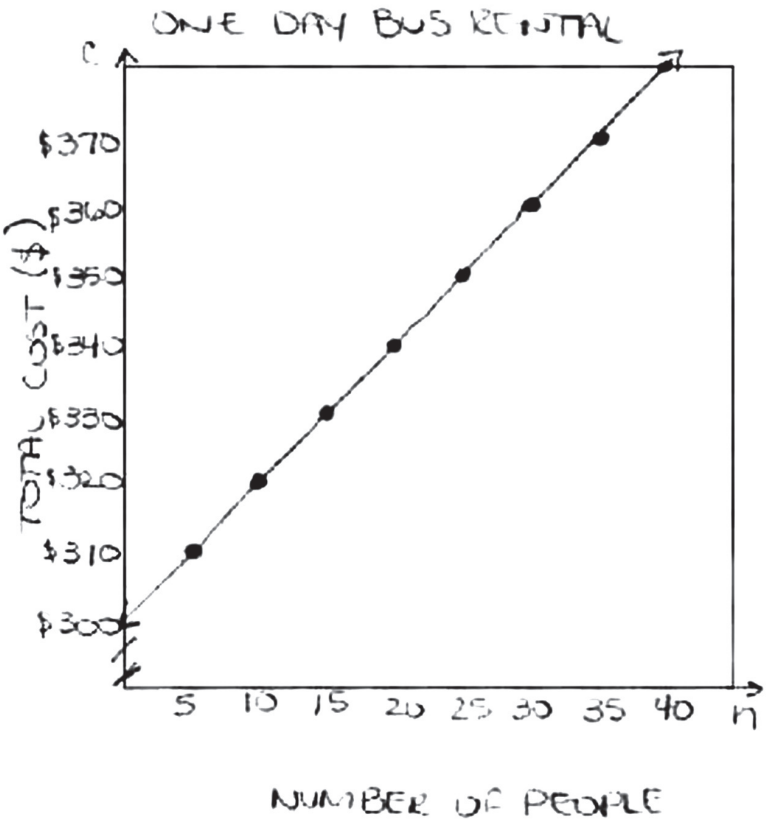
$C = 300 + 2(10) = 320$

$C = 300 + 2(20) = 340$

$C = 300 + 2(30) = 360$

TABLE

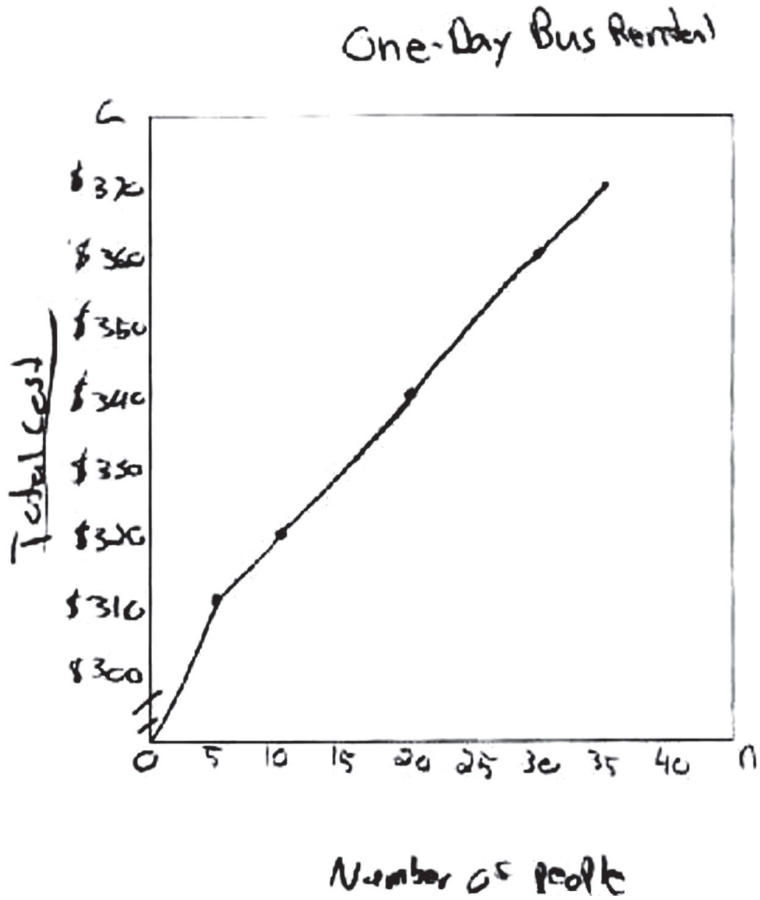
# OF PEOPLE	COST (1 DAY)
10	320
20	340
30	360



Score Point: 4

	# of people (n)	Bus rental (B)	Cost of people	cost per day (C=2n+300)
group1	10	300	2n	320
group2	20	300	2n	340
group3	30	300	2n	360

$C = 2n + 300$



Score Point: 3

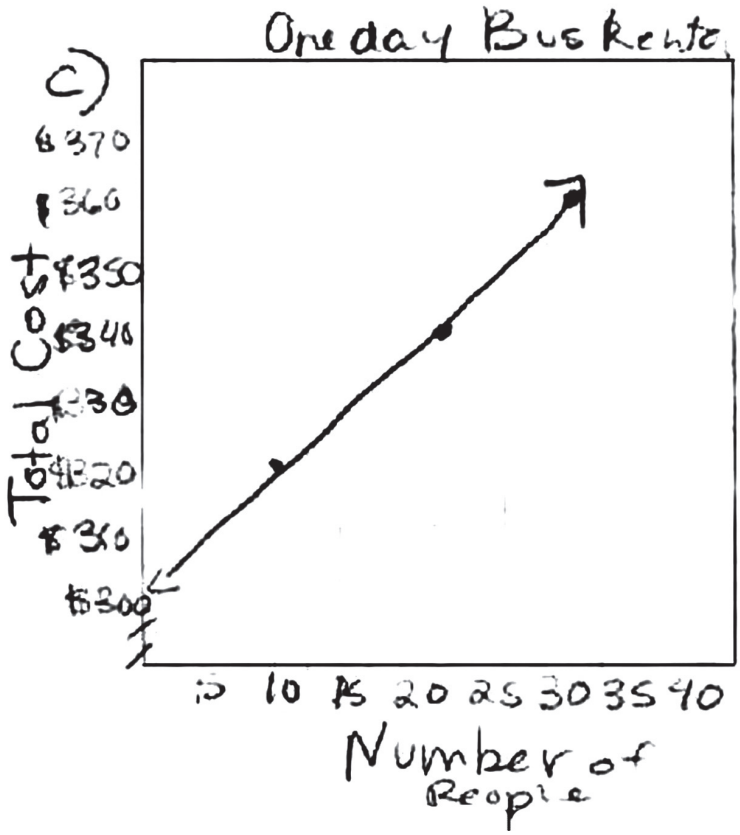
a) 10 people
$320

20 people
$340

30 people
$360

B) C = 300 + 2 × 10
C = 300 + 2 × 20
C = 300 + 2 × 30

c)

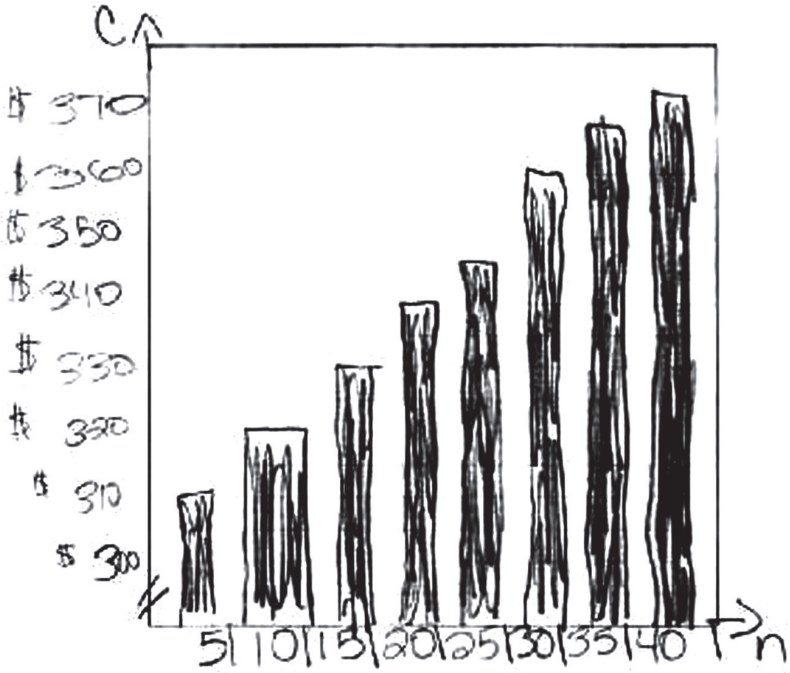


Score Point: 2

a.

People going	10	20	30
Per person	$20	$40	$60

b. $300c \div n + 2$



Score Point: 1

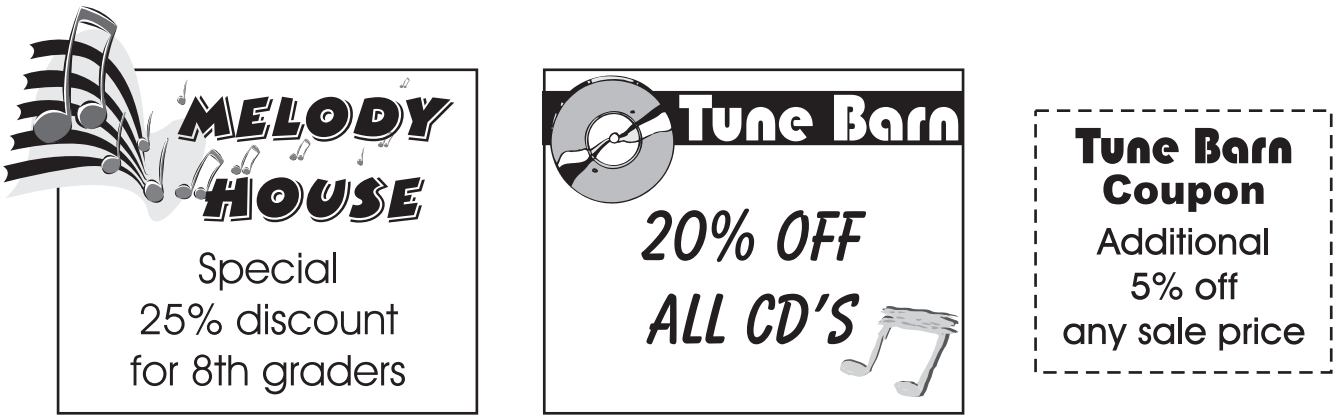
Item 3 Music Coupons

Standard: MA-08-1.4.01: Ratios and Proportional Reasoning – Students will apply ratios and proportional reasoning to solve real-world problems (e.g., percents, constant rate of change, unit pricing, percent of increase or decrease).

Bloom's Taxonomy: Application

Depth of Knowledge: Level 2

Use the advertisements below to answer question 3.



3. Randy, an 8th grader, is going to buy a CD at either Melody House or Tune Barn. At both stores, the regular price of the CD he wants to purchase is $18. Randy has a 5% coupon from Tune Barn that can be used on sale items. At which store will the CD cost less? Describe or show how you found your answer.

Music Coupons

Scoring Guide

Score	Description
4	The student response demonstrates an exemplary understanding of the concepts involved in percent of discount by using percents to accurately compute discount and additional discount.
3	The student response demonstrates a good understanding of the concepts involved in percent of discount and additional discount. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is missing or flawed. As a result the response merits 3 points.
2	The student response demonstrates a fair understanding of the concepts involved in percent of discount by correctly computing a percent of discount at least once. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
1	The student response demonstrates a minimal understanding of the concepts involved in percent of discount.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Sample Responses:

Melody House $18 × 0.75 = $13.50

Tune Barn $18 × 0.8 = $14.40 $14.40 × 0.95 = $13.68

Melody House is cheaper.

OR

Melody House 25% × 18 = $4.50

Tune Barn 20% × 18 + 5% × (80% of 18) = 3.60 + 0.72 = $4.32

Melody House gives the better discount.

Sample Student Responses

Music Coupons

25% off of $18 = $4.50

$18.00
− $4.50
$13.50

20% off of $18 = $3.60

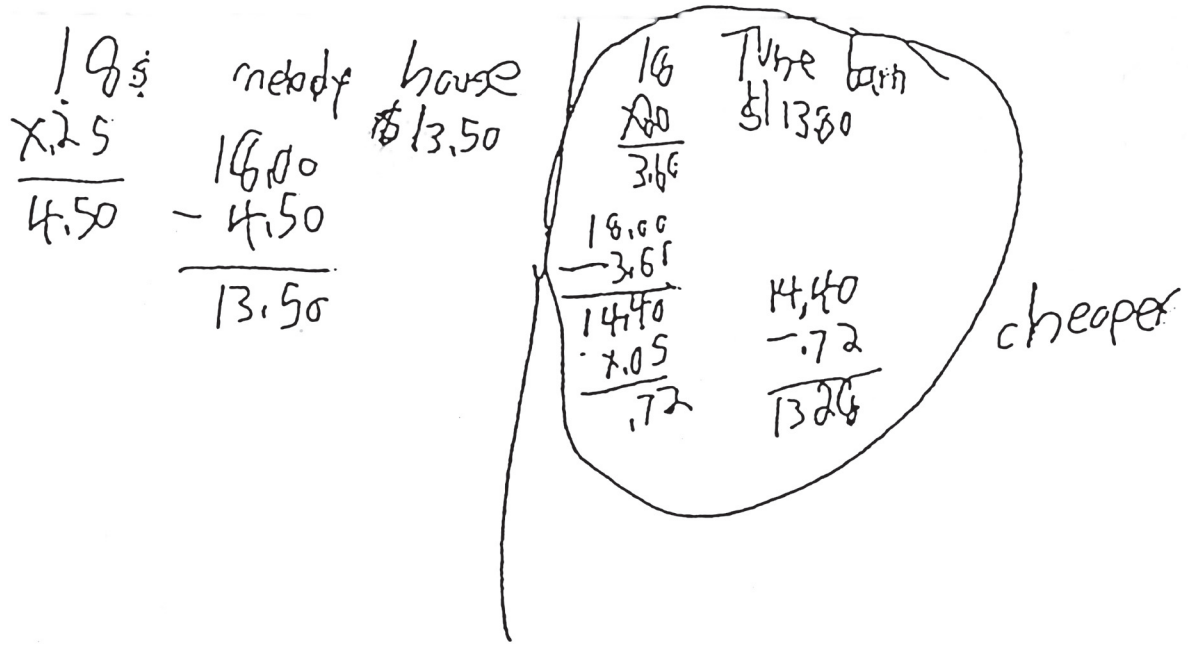
$18.00
− $3.60
$14.40

5% off of $14.40 = $0.72

$14.40
− $0.72
$13.68

It is cheaper at Melody House.

Score Point: 4



Score Point: 3

Melody House

$18.00 x 25% = $13.50

Tune Barn

$18.00 x 20% = $14.40

$14.40 x 5% = $13.68

the cd at Melody house will cost less.

Score Point: 2

It would cost less at Tune Barn because there's 20% off all CD's plus he has the coupon.

18 x 20% = $3.60 x 5% = 0.18

At the Melody House it would cost him $4.50 $18 x 25% = 4.50

Score Point: 1

Item 4 School Breakfast Menu

Standard: MA-08-4.4.01: Probability – Students will apply counting techniques to determine the size of a sample space for a real-world or mathematical situation.

Bloom's Taxonomy: a. Comprehension
b. Analysis

Depth of Knowledge: Level 2

4. The choices for breakfast at Washington School are shown on the menu below.

School Breakfast Menu

Cereal	Muffins	Beverages
Wheataloes	Apple Banana	Milk
Fruit Hoops	Blueberry	Orange Juice
Sugar Curls	Chocolate Chip	
	Poppy Seed	

a. How many different combinations are possible if only one selection is made from each category (cereal, muffins, and beverages)? Explain or show how you found your answer.

b. One more item is going to be added to one of the food categories. An item added to which category will produce the **greatest** increase in the number of possible breakfast combinations? Explain your answer.

School Breakfast Menu

Scoring Guide

Score	Description
4	The student response demonstrates an exemplary understanding of the concepts involved in applying counting techniques to determine the size of a sample space for a real-world situation.
3	The student response demonstrates a good understanding of the concepts involved in applying counting techniques to determine the size of a sample space for a real-world situation. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is missing or flawed. As a result the response merits 3 points.
2	The student response demonstrates a fair understanding of the concepts involved in applying counting techniques to determine the size of a sample space for a real-world situation. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
1	The student response demonstrates a minimal understanding of the concepts involved in applying counting techniques to determine the size of a sample space for a real-world situation.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Sample Responses:

Part a: $3 \times 4 \times 2 = 24$

Part b: Adding 1 cereal, the total is $4 \times 4 \times 2 = 32$.

Adding 1 muffin, the total is $3 \times 5 \times 2 = 30$.

Adding 1 beverage, the total is $3 \times 4 \times 3 = 36$.

Sample Student Responses

School Breakfast Menu

(a) there are 24 different combinations for letter a. I found this out by multiply all of the cereals by the muffins, and by the beverages.

Cereals		Muffins		Beverages		
3	×	4	×	2	=	24 combinations

(b) An item added to the beverage group will produce the biggest increase because it will be more to choose from and many more combinations will be able to be made.

Added to: (total)

C	M	B
32	30	36 ← most combinations!

Score Point: 4

Combo of breakfast

Wheatalees	Fruit Hoops	Sugar Curls
WAm	Fam	sam
wbm	Fbm	sbm
wcm	Fcm	scm
wpm	Fpm	spm
wao	Fao	sao
wbo	Fbo	sbo
wco	Fco	sco
wpo	Fpo	spo

type	# increase
Cereal	8
Muffins	6
Beverages	12

adding an item to the beverages would increase the # of combos by the most, 12.

Score Point: 3

a) There are 24 possible combinations.
3 (cereal) x 4 (muffins) = 12 x 2 (beverages) = 24

b)

School breakfast Menu		
Cereal	Muffins	Beverages
Wheatalocs Fruit Hoops Sugar Curls	Apple Banana Blueberry Chocolate Chip Poppyseed Corn	Milk Orange Juice

There are 30 possible combinations. I added one more muffin flavor to the menu. Then I multiplied.
3 (cereal) x 5 (muffins) = 15
15 x 2 (Beverages) = 30

Score Point: 2

a.) There are 24 different breakfast combinations. I found my answer by sorting them out and pairing them up to see all the different choices.

b.) an item to the leverages catagory would increase the most possible number of combinations

Score Point: 1