

***2004 CSAP Released Items***

***Grade 5 Mathematics***

- 1** During the summer, Henry earns \$5 per hour babysitting and \$4 per hour mowing lawns.

**Part A** Henry babysat a total of 48 hours. How much money did he earn babysitting? In the space below, show your work and write your answer on the line.

\$ \_\_\_\_\_

**Part B** Including the 48 hours of babysitting, Henry earned a total of \$308 by the end of summer. How many hours did he spend mowing lawns? In the space below, show your work and write your answer on the line.

\_\_\_\_\_ hours

## CSAP Mathematics Scoring Guide

### Item 1:

#### Rubric

#### Exemplary Response

##### *Part A*

- \$240

AND

- $48 \text{ hours} \times \$5 = 240$

##### *Part B*

- 17 hours

AND

- $\$308 - 240 = 68$

$$68 \div \$4 = 17$$

OR

- Other valid process

**Score Points:** Apply 2-point holistic rubric.

**This item appeared at only one grade level.**

#### Grade 5

Standard 6.2c: Operations and Calculations

Subcontent Area: not classified

49

During the summer, Henry earns \$5 per hour babysitting and \$4 per hour mowing lawns.

**Part A** Henry babysat a total of 48 hours. How much money did he earn babysitting? In the space below, show your work and write your answer on the line.

$$\begin{array}{r} 48 \\ \hline 2 \overline{) 240} \\ \underline{40} \\ 00 \\ \underline{00} \\ 00 \end{array}$$

\$ 240

**Part B** Including the 48 hours of babysitting, Henry earned a total of \$308 by the end of summer. How many hours did he spend mowing lawns? In the space below, show your work and write your answer on the line.

$$\begin{array}{r} 308 \\ - 240 \\ \hline 68 \end{array}$$

$$\begin{array}{r} 4 \overline{) 68} \\ \underline{40} \\ 28 \\ \underline{20} \\ 8 \\ \underline{8} \\ 0 \end{array}$$

17 hours

2 Point Anchor

Part A: Correct Process and Answer.

Part B: Correct Process and Answer.

2pts  
*[Signature]*

5M-3301

49

During the summer, Henry earns \$5 per hour babysitting and \$4 per hour mowing lawns.

**Part A** Henry babysat a total of 48 hours. How much money did he earn babysitting? In the space below, show your work and write your answer on the line.

$$\begin{array}{r} 48 \\ \times 5 \\ \hline 240 \end{array}$$

\$ 240

**Part B** Including the 48 hours of babysitting, Henry earned a total of \$308 by the end of summer. How many hours did he spend mowing lawns? In the space below, show your work and write your answer on the line.

$$\begin{array}{r} 77 \\ 4 \overline{)308} \\ \underline{28} \phantom{0} \\ 28 \phantom{0} \\ \underline{28} \\ 00 \end{array}$$

77 hours

1 Point Anchor

Part A: Correct Process and Answer.  
Part B: Incorrect Process and Answer.

1 pt  
CM

5M-3302

49

During the summer, Henry earns \$5 per hour babysitting and \$4 per hour mowing lawns.

**Part A** Henry babysat a total of 48 hours. How much money did he earn babysitting? In the space below, show your work and write your answer on the line.

$\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \\ + 48 \\ \hline 68 \end{array}$ <p>\$ <u>68</u></p>
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**Part B** Including the 48 hours of babysitting, Henry earned a total of \$308 by the end of summer. How many hours did he spend mowing lawns? In the space below, show your work and write your answer on the line.

$\begin{array}{r} 260 \\ \times 4 \\ \hline 1040 \\ - 48 \\ \hline 260 \end{array}$ <p><u>260</u> hours</p>
---

0 Point Anchor

Part A: Incorrect Process and Answer.

Part B: Incorrect Process and Answer.

*anchor*  
*Opt*  
*CM*

5M-3312

***2004 CSAP Released Items***

***Grade 5 Mathematics***

*(This Item is also shared at Grade 6)*

2

The table below shows the amounts of money Vince receives for selling bunches of flowers at the farmers' market.

Flower Sales

Number of Bunches	20	25	30	35
Amounts of Money	\$120	\$150	\$180	

**Part A** Complete the table to show the amount of money Vince receives for selling 35 bunches of flowers.

**Part B** On the lines below, explain the rule used in the pattern.

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**Part C** Vince pays \$45 each day for a place at the farmers' market. One day, he sold 8 bunches of flowers. Did Vince receive enough money to pay for his place that day?

In the space below, show your work and explain your reasoning, and write your answer on the line.

Did Vince receive enough money? \_\_\_\_\_



**Item 2:**

**Rubric**

**Exemplary Response**

**Part A**

- **Flower Sales**

<b>Number of Bunches</b>	20	25	30	35
<b>Amounts of Money</b>	\$120	\$150	\$180	<b>\$210</b>

**Part B**

- The money that was made increases by \$30 with every 5 bunches of flowers sold.

**OR**

- Multiply each number of bunches of flowers by 6 to get the money made.

**OR**

- Other valid explanation

**Part C**

- Did Vince receive enough money? **Yes**
- Vince did make enough money to pay for his place. He makes \$6 for each bunch, so if he sold 8 bunches, he made  $\$6 \times 8 = \$48$ . If his place is \$45, Vince had enough plus a little extra.

**OR**

- Other valid explanation

**Score Points:** Apply 3-point holistic rubric.

**This item appeared at two adjacent grade levels.**

**Grade 5**

Standard 2.5a: Patterns, Functions, and Algebra

Subcontent Area: patterns

**Grade 6**

Standard 2.5a: Patterns, Functions, and Algebra

Subcontent Area: patterns

31

The table below shows the amounts of money Vince receives for selling bunches of flowers at the farmers' market.

Flower Sales

Number of Bunches	20	25	30	35
Amounts of Money	\$120	\$150	\$180	210

335  
14  
210

**Part A** Complete the table to show the amount of money Vince receives for selling 35 bunches of flowers.

**Part B** On the lines below, explain the rule used in the pattern.

The rule used in the pattern is  
multiply the number of bunches by  
6 and you get the amount of money.

**Part C** Vince pays \$45 each day for a place at the farmers' market. One day, he sold 8 bunches of flowers. Did Vince receive enough money to pay for his place that day?

In the space below, show your work and explain your reasoning, and write your answer on the line.

$\begin{array}{r} \times 8 \\ 6 \\ \hline 48 \end{array}$	$48 > 45$
Did Vince receive enough money? <u>Yes</u>	

3 Pts.

OM

OK  
3 pts  
answer

5M-1301



31

The table below shows the amounts of money Vince receives for selling bunches of flowers at the farmers' market.

Flower Sales

Number of Bunches	20	25	30	35
Amounts of Money	\$120	\$150	\$180	\$210

**Part A** Complete the table to show the amount of money Vince receives for selling 35 bunches of flowers.

**Part B** On the lines below, explain the rule used in the pattern.

The pattern would be  
adding 30 to the money  
amount

**Part C** Vince pays \$45 each day for a place at the farmers' market. One day, he sold 8 bunches of flowers. Did Vince receive enough money to pay for his place that day?

In the space below, show your work and explain your reasoning, and write your answer on the line.

Did Vince receive enough money? no

1 Pt.

CM  
1st anchor

5M-1303



The table below shows the amounts of money Vince receives for selling bunches of flowers at the farmers' market.

Flower Sales

Number of Bunches	20	25	30	35
Amounts of Money	\$120	\$150	\$180	111

**Part A** Complete the table to show the amount of money Vince receives for selling 35 bunches of flowers.

**Part B** On the lines below, explain the rule used in the pattern.

The rule is add 3 to  
each one.

**Part C** Vince pays \$45 each day for a place at the farmers' market. One day, he sold 8 bunches of flowers. Did Vince receive enough money to pay for his place that day?

In the space below, show your work and explain your reasoning, and write your answer on the line.

$\begin{array}{r} \text{1111} \\ \text{1111} \\ \hline \text{222} \end{array}$	<p>Because, he would have 222</p>
<p>Did Vince receive enough money? <u>yes</u></p>	

*CPM  
OK Opt  
Anchor*

***2004 CSAP Released Items***

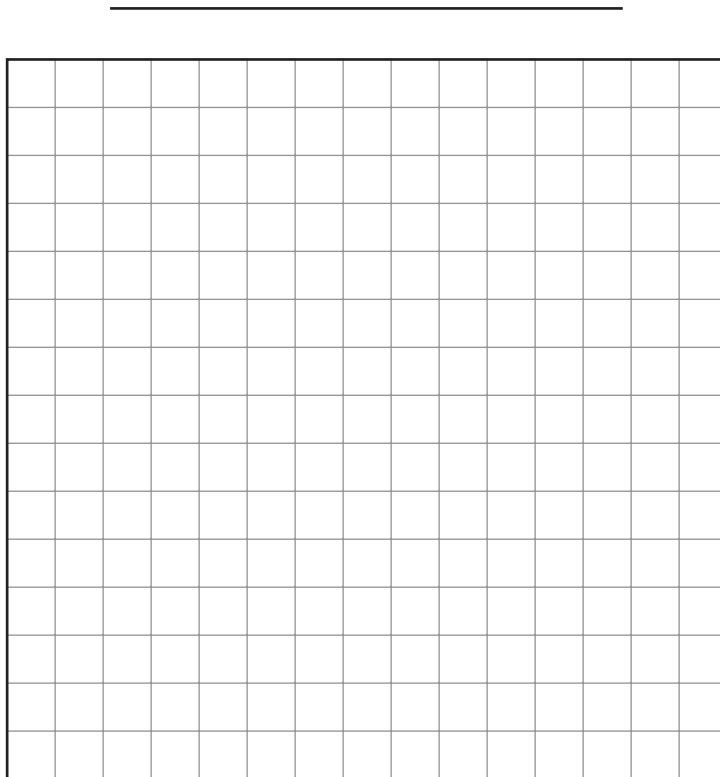
***Grade 6 Mathematics***

- 3** The table below shows the number of visitors to Bent's Fort from March through September.

**Visitors to Bent's Fort**

Month	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.
Number of Visitors (rounded to nearest hundred)	1,600	3,200	4,100	4,300	6,100	3,300	2,400

**Part A** On the grid below, construct a **bar graph** to show the information from the table.





Use information from the graph on page 6 to answer the following questions.

**Part B** According to the months shown, what were the three most popular months to visit Bent's Fort?

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**Part C** Which month had the greatest change in the number of visitors compared to the previous month?

\_\_\_\_\_

**Part D** On the lines below, describe the month-to-month change in the number of visitors from March through September.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

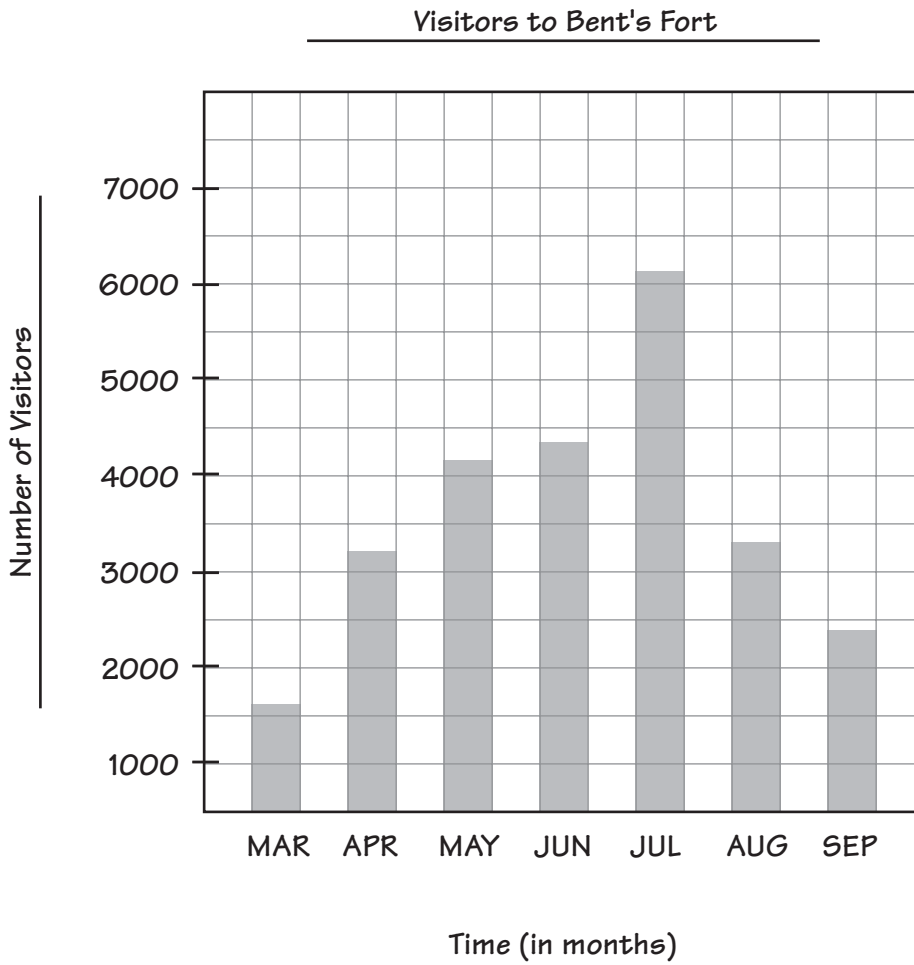
**Item 3:**

**Rubric**

**Exemplary Response**

**Part A**

- 



**Part B**

- 1) May
- 2) June
- 3) July

**Part C**

- August

***Part D***

- The number of visitors increased each month from March through July, decreased sharply in August, and continued to fall in September.

**OR**

- Other valid statement

**Score Points:** Apply 4-point holistic rubric.

**This item appeared at only one grade level.**

**Grade 6**

Standard 3.1a: Data Analysis, Probability, and Statistics

Subcontent Area: not classified

Rater Severity Study 2004

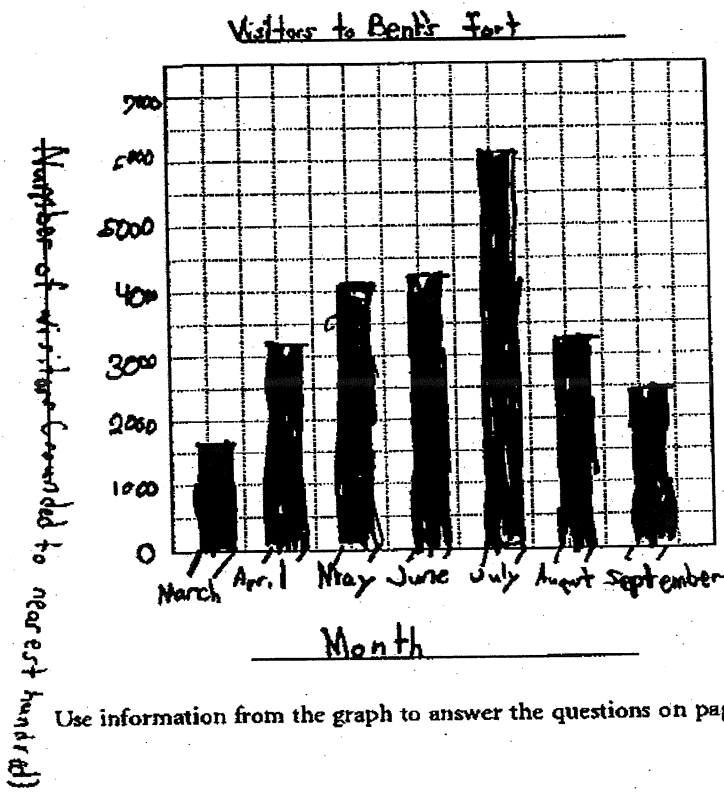


The table below shows the number of visitors to Bent's Fort from March through September.

Visitors to Bent's Fort

Month	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.
Number of Visitors (rounded to nearest hundred)	1,600	3,200	4,100	4,300	6,100	3,300	2,400

Part A On the grid below, construct a bar graph to show the information from the table.



4/10/02

4 point  
anchor  
J. Galliker

**Part B** According to the months shown, what were the three most popular months to visit Bent's Fort?

- 1) May
- 2) June
- 3) July

**Part C** Which month had the greatest change in the number of visitors compared to the previous month?

August

**Part D** On the lines below, describe the month-to-month change in the number of visitors from March through September.

March started real low at 1600 people then  
April started the big rise along with May and  
June. Then July topped up with 6,100  
people. In the later months (August, September)  
The number began to decrease

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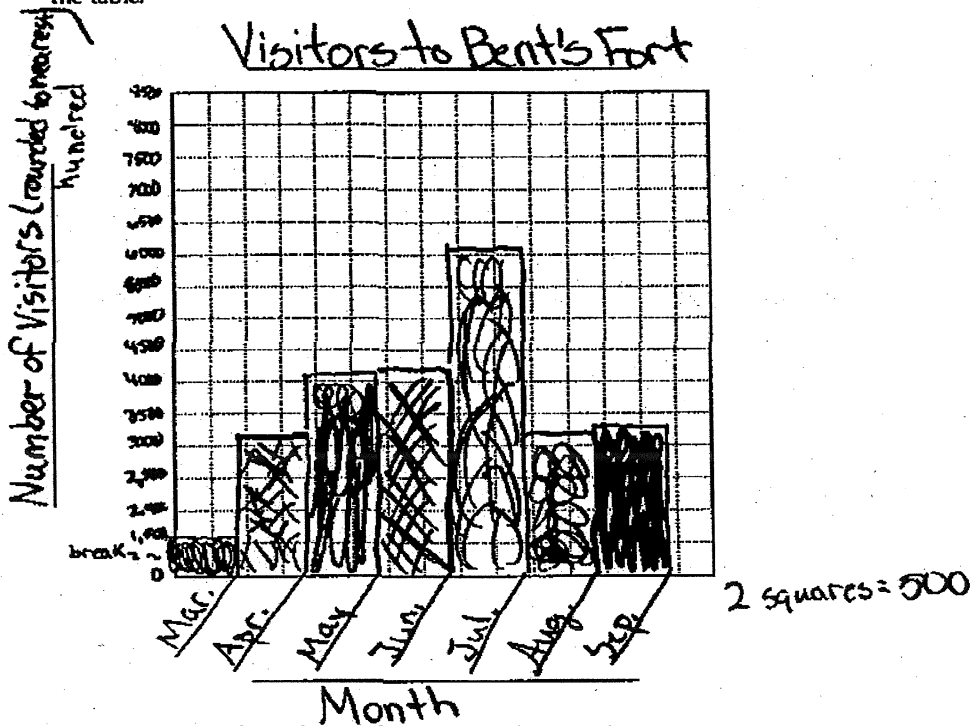


The table below shows the number of visitors to Bent's Fort from March through September.

Visitors to Bent's Fort

Month	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.
Number of Visitors (rounded to nearest hundred)	1,600	3,200	4,100	4,300	6,100	3,300	2,400

Part A On the grid below, construct a bar graph to show the information from the table.



Use information from the graph to answer the questions on page 31.

4/10/02

3 point anchor  
paper

J. Hollibaugh

**Part B** According to the months shown, what were the three most popular months to visit Bent's Fort?

- 1) July
- 2) May
- 3) June

**Part C** Which month had the greatest change in the number of visitors compared to the previous month?

April

**Part D** On the lines below, describe the month-to-month change in the number of visitors from March through September.

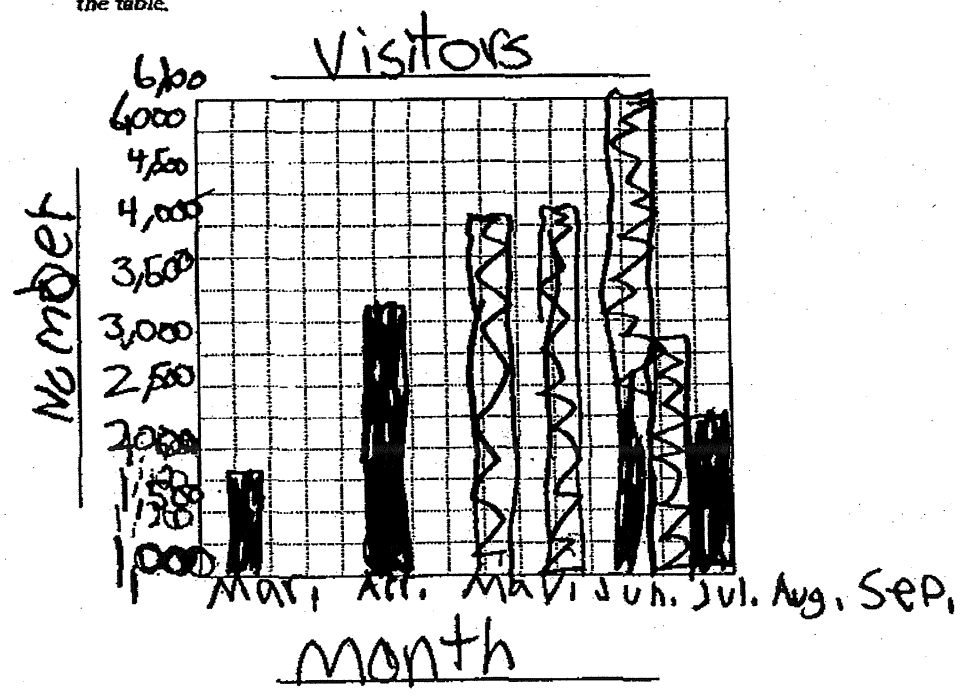
In March it started out at 1,600, then in  
April it boosted up to 3,200. In May there  
were 4,100 visitors and in June 4,300. In  
July there was the highest amount which  
was 6,100, and in August it decreased to  
3,300. In September it decreased even  
more to 2,400.

The table below shows the number of visitors to Bent's Fort from March through September.

Visitors to Bent's Fort

Month	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.
Number of Visitors (rounded to nearest hundred)	1,600	3,200	4,100	4,300	6,100	3,300	2,400

Part A On the grid below, construct a bar graph to show the information from the table.



2 pt anchor  
 J. Galliker  
 4/10/02



**Part B** According to the months shown, what were the three most popular months to visit Bent's Fort?

- 1) July
- 2) June
- 3) May

**Part C** Which month had the greatest change in the number of visitors compared to the previous month?

July

**Part D** On the lines below, describe the month-to-month change in the number of visitors from March through September.

because it is warmer  
in the summer.

*2-point anchor  
paper*

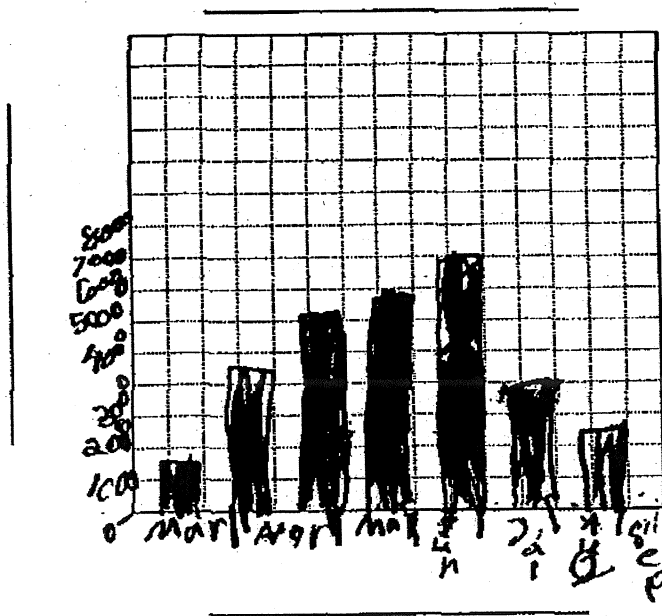


The table below shows the number of visitors to Bent's Fort from March through September.

Visitors to Bent's Fort

Month	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.
Number of Visitors (rounded to nearest hundred)	1,600	3,200	4,100	4,300	6,100	3,300	2,400

Part A On the grid below, construct a bar graph to show the information from the table.



Use information from the graph to answer the questions on page 31.

1 pt anchor  
 4/10/02 J. Hollister

**Part B** According to the months shown, what were the three most popular months to visit Bent's Fort?

- 1) 2
- 2) 1
- 3) 3

**Part C** Which month had the greatest change in the number of visitors compared to the previous month?

15

**Part D** On the lines below, describe the month-to-month change in the number of visitors from March through September.

I think it is 15.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

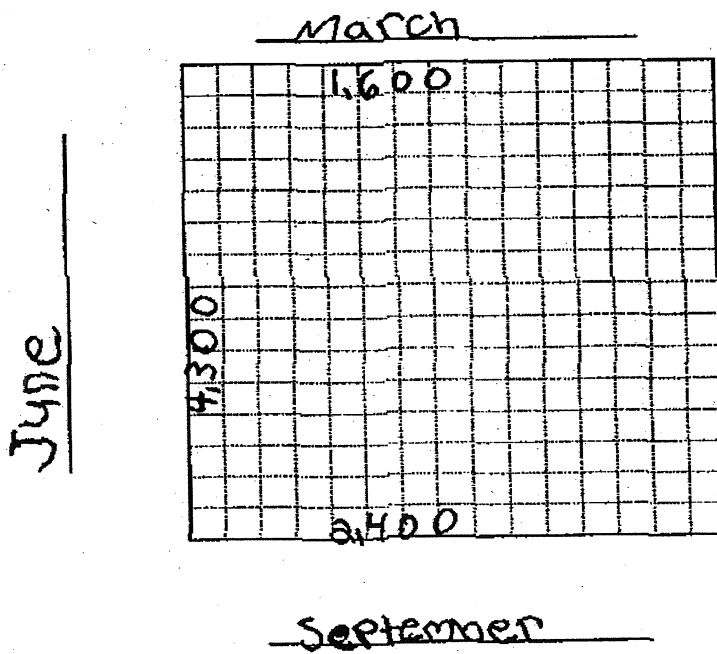


The table below shows the number of visitors to Bent's Fort from March through September.

Visitors to Bent's Fort

Month	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.
Number of Visitors (rounded to nearest hundred)	1,600	3,200	4,100	4,300	6,100	3,300	2,400

Part A On the grid below, construct a bar graph to show the information from the table.



Opt anchor  
J. Gallivan  
4/10/02

**Part B** According to the months shown, what were the three most popular months to visit Bent's Fort?

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**Part C** Which month had the greatest change in the number of visitors compared to the previous month?

July \_\_\_\_\_

**Part D** On the lines below, describe the month-to-month change in the number of visitors from March through September.

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***2004 CSAP Released Items***

***Grade 7 Mathematics***

*(This Item is also shared at Grade 8)*

- 4** The Denver Broncos played 16 games in the 1999 regular season. The table below shows the total points scored by the Broncos for each game.

**Denver Broncos  
Points Scored in 1999 Season**

Game	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Points	36	42	33	22	19	21	44	21	30	27	38	38	38	31	7	38

The mean of the points scored by the Broncos in 1999 is 30 points (rounded to the nearest whole number).

**Part A** Find the median of the points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

Median of points \_\_\_\_\_

**Part B** Find the mode of points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

Mode of points \_\_\_\_\_

**Part C** Find the range of points scored in the 1999 season. In the space below, show your work and write your answer on the line.

Range of points \_\_\_\_\_

**Part D** Carmen is writing an article about the Broncos for the school newspaper. She will use one measure of central tendency from the 1999 season to describe as accurately as possible the Broncos' ability to score points. On the lines below, write the measure of central tendency (mean, median, or mode) she should use and explain your thinking.

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**Item 4:**

**Rubric**

**Exemplary Response**

***Part A***

- Median of points **32**

**AND**

- The points scored arranged from lowest to highest are 7, 19, 21, 21, 22, 27, 30, 31, 33, 36, 38, 38, 38, 38, 42, 44 points and the middle two numbers are 31 and 33, and the mean of 31 and 33 is 32.

***Part B***

- Mode of points **38**

**AND**

- The score 38 appears 4 times and is the most frequent score.

***Part C***

- Range of points **37**

**OR**

- Range of points **7 to 44**

**AND**

- The low score is 7 and the high score is 44, and the difference is 37.

**Part D**

- Carmen should use the median of points scored to most accurately describe the ability of the Broncos to score points. The mean includes an uncharacteristic low score of 7 points. The mode of 38 is too high a score to be an accurate description.

**OR**

- Other valid response

**Score Points:** Apply 3-point holistic rubric.

**This item appeared at two adjacent grade levels.**

**Grade 7**

Standard 3.2a: Data Analysis, Probability, and Statistics

Subcontent Area: not classified

**Grade 8**

Standard 3.2a: Data Analysis, Probability, and Statistics

Subcontent Area: not classified

Item 35

The Denver Broncos played 16 games in the 1999 regular season. Study the table below, which shows the total points scored by the Broncos for each game.

**Denver Broncos  
Points Scored in 1999 Season**

Game	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Points	7	19	21	21	22	27	30	31	33	36	39	38	38	38	17	44

The mean of the points scored by the Broncos in 1999 is 30 points (rounded to the nearest whole number).

**Part A** Find the median of the points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

median = middle

7, 19, 21, 21, 22, 27, 30, 31, 33, 36, 39, 38, 38, 38, 38, 42, 44

$$\begin{array}{r} 31 \\ +33 \\ \hline 64 \\ \hline 2 \end{array}$$

Median of points 32 points

**Part B** Find the mode of points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

mode = # most often

7, 19, 21, 21, 22, 27, 30, 21, 33, 36, 38, 38, 38, 38, 42, 44

38 4 times

Mode of points 38 points

Part C Find the range of points scored in the 1999 season. In the space below, show your work and write your answer on the line.

Range = highest pts - lowest pts  
highest = 44 lowest = 7

$$\begin{array}{r} 44 \\ - 7 \\ \hline 37 \end{array}$$

Range of points 37 pts

Part D Carmen is writing an article about the Broncos in the school newspaper. She will use one measure of central tendency from the 1999 season to describe as accurately as possible the Broncos' ability to score points. On the lines below, write the measure of central tendency (mean, median, or mode) she should use and explain your thinking.

She should use the mode. That way, she will know the number of points the Broncos score most often without including numbers that are too high or too low and might throw off her answer.

CSAP 2004

Rib 1- Item 35

Denver Broncos Scoring Analysis - 1999

3 Point Anchor

The student effectively communicates a mathematical understanding of the task by showing a correct median, mode and range of points with support. In part D, the student selects mode and provides support for their selection.

Item 35

The Denver Broncos played 16 games in the 1999 regular season. Study the table below, which shows the total points scored by the Broncos for each game.

Denver Broncos  
Points Scored in 1999 Season

Game	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Points	36	42	33	22	19	21	44	21	30	27	38	38	38	31	7	38

The mean of the points scored by the Broncos in 1999 is 30 points (rounded to the nearest whole number).

**Part A** Find the median of the points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

7, 19, 21, 21, 22, 27, 30, 31, 33, 34, 38, 38, 38, 38  
42, 44

Median of points 44

**Part B** Find the mode of points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

7, 19, 21, 21, 22, 27, 30, 31, 33, 34, 38, 38, 38, 38, 40, 44

Mode of points 38

**Part C** Find the range of points scored in the 1999 season. In the space below, show your work and write your answer on the line.

$\begin{array}{r} 34 \\ 44 \\ \hline 37 \end{array}$
Range of points <u>37</u>

**Part D** Carmen is writing an article about the Broncos in the school newspaper. She will use one measure of central tendency from the 1999 season to describe as accurately as possible the Broncos' ability to score points. On the lines below, write the measure of central tendency (mean, median, or mode) she should use and explain your thinking.

I think Carmen should write her  
article on the mode because that's  
the number that they mostly got.

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CSAP 2004

Rib 1- Item 35

Denver Broncos Scoring Analysis - 1999

2 Point Anchor

The student shows some evidence of understanding by completing part of the task when showing a correct mode and range of points. The student shows lack of understanding in computing the median. Student selects and defines mode in part D.

Item 35

The Denver Broncos played 16 games in the 1999 regular season. Study the table below, which shows the total points scored by the Broncos for each game.

**Denver Broncos  
Points Scored in 1999 Season**

Game	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Points	36	42	33	22	19	21	44	21	30	27	38	38	38	31	7	38

The mean of the points scored by the Broncos in 1999 is 30 points (rounded to the nearest whole number).

**Part A** Find the median of the points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

Median of points ~~30~~ 21

**Part B** Find the mode of points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

Mode of points 22pts & 38pts

**Part C** Find the range of points scored in the 1999 season. In the space below, show your work and write your answer on the line.

7, 19, 21, 21, 22, 27, 30, 31, 33, 36, 38, 38, 38, 38, 42, 44

Range of points 7-44

**Part D** Carmen is writing an article about the Broncos in the school newspaper. She will use one measure of central tendency from the 1999 season to describe as accurately as possible the Broncos' ability to score points. On the lines below, write the measure of central tendency (mean, median, or mode) she should use and explain your thinking.

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CSAP 2004 Rib 1- Item 35  
Denver Broncos Scoring Analysis - 1999  
1 Point Anchor  
The student demonstrates some mathematical understanding of the task by computing a correct range of points. The student shows lack of understanding for median and mode and does not attempt to address part D.

**1 ANCHOR**

**8M-0303a**



Item 35

The Denver Broncos played 16 games in the 1999 regular season. Study the table below, which shows the total points scored by the Broncos for each game.

**Denver Broncos  
Points Scored in 1999 Season**

Game	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Points	36	42	33	22	19	21	44	21	30	27	38	38	38	31	7	38

The mean of the points scored by the Broncos in 1999 is 30 points (rounded to the nearest whole number).

**Part A** Find the median of the points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

$$\begin{array}{r} 38 \\ - 36 \\ \hline 2 \end{array}$$

I took the two ends  
and subtracted

Median of points 2 points

**Part B** Find the mode of points scored per game in the 1999 season. In the space below, show your work and write your answer on the line.

$$\begin{array}{r} 38 \\ - 20 \\ \hline 18 \end{array}$$

Mode of points 18

**Part C** Find the range of points scored in the 1999 season. In the space below, show your work and write your answer on the line.

Handwritten student work for Part C. The student has written  $4\frac{1}{2}$  and  $24\frac{1}{2}$  above a horizontal line. An arrow points from  $21-30$  to  $24\frac{1}{2}$ . There is a scribble above the arrow. Below the line, the student has written "Range of points  $24\frac{1}{2}$  points".

**Part D** Carmen is writing an article about the Broncos in the school newspaper. She will use one measure of central tendency from the 1999 season to describe as accurately as possible the Broncos' ability to score points. On the lines below, write the measure of central tendency (mean, median, or mode) she should use and explain your thinking.

Carmen, you should tell the people that the Broncos median is 2 pts. The mode for them is 18 pts. The range is about 24. If you don't understand any of this, I will send my work, with this letter.

CSAP 2004

Rib 1- Item 35

Denver Broncos Scoring Analysis - 1999

0 Point Anchor

The student demonstrates no mathematical understanding of the task by showing incorrect values and processes for median, mode and range of points. The student does not select a measurement in part D.

**0 ANCHOR**

**8M-I35-0304a**

***2004 CSAP Released Items***

***Grade 8 Mathematics***

- 5 Sam will mix together green, blue, and white paint. He mixes 5 pints of green paint and 7 pints of blue paint. He will make the mixture 25 percent white paint.

How many pints of white paint should Sam add to the mixture? In the space below, show your work and write your answer on the line.

\_\_\_\_\_ pints of white paint

**Item 5:**

**Rubric**

**Exemplary Response**

- 4 pints of white paint

**AND**

- The mixture before adding white contained 12 pints of paint. If 2 pints of white paint are added, the percent of white paint is  $\frac{2}{14} = 14.3$  percent, which is not 25 percent. If 3 pints of white paint are added, the percent of white paint is  $\frac{3}{15} = 20$  percent, which is not 25 percent. By adding 4 pints of white paint, the mixture total is 16 pints, and the percent of white paint is  $\frac{4}{16} = 25$  percent.

**OR**

- Other valid response

**Score Points:** Apply 2-point holistic rubric.

**This item appeared at only one grade level.**

**Grade 8**

Standard 1.4a: Number Sense

Subcontent Area: proportional thinking

48

Sam will mix together green, blue, and white paint. He mixes 5 pints of green paint and 7 pints of blue paint. He will make the mixture 25 percent white paint.

How many pints of white paint should Sam add to the mixture? In the space below, show your work and write your answer on the line.

$$\frac{75}{100} = \frac{12}{x}$$
$$75x = 1200$$
$$x = 16$$

$$\begin{array}{r} 3 \\ 75 \overline{) 1200} \\ \underline{225} \phantom{0} \\ 450 \\ \underline{450} \\ 0 \end{array}$$

$$\begin{array}{r} 16 \\ 2 \overline{) 32} \\ \underline{32} \\ 0 \end{array}$$

4 pints of white paint



2 Point Anchor

*Handwritten signature*  
4/12/04



Sam will mix together green, blue, and white paint. He mixes 5 pints of green paint and 7 pints of blue paint. He will make the mixture 25 percent white paint.

How many pints of white paint should Sam add to the mixture? In the space below, show your work and write your answer on the line.

$\frac{1}{25}$        $\frac{12}{120}$   
 ~~$\frac{12}{120}$~~   
 $\frac{1240}{320}$

\_\_\_\_\_ 3 \_\_\_\_\_ pints of white paint



1 pt. Anchor

8M-1401

SB 4/12/04



Sam will mix together green, blue, and white paint. He mixes 5 pints of green paint and 7 pints of blue paint. He will make the mixture 25 percent white paint.

How many pints of white paint should Sam add to the mixture? In the space below, show your work and write your answer on the line.

$$\begin{array}{r} 125 \\ 205 \\ \hline 100 \end{array}$$

5 pints - green  
7 pints - blue  

---

13 pints

want 25% of white

20 pints of white paint

ok

~~0 Point Backup Anchor~~

PD

4/12/04

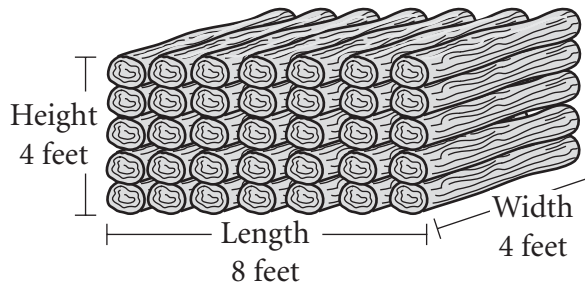
0 Pt. Anchor



***2004 CSAP Released Items***

***Grade 8 Mathematics***

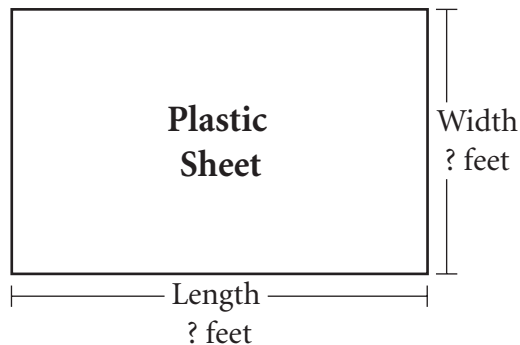
- 6 Carl has a stack of wood with the measurements shown below. He will cover the top and all 4 sides of the stack with a plastic sheet.



**Part A** What is the total surface area the plastic sheet must cover? In the space below, show your work and write your answer on the line.

\_\_\_\_\_ square feet

The diagram below represents a plastic sheet with unknown measurements.



**Part B** What are the dimensions of the smallest rectangular plastic sheet that can be used to cover the stack of wood? In the space below, show your work and write your answers on the lines.

Width \_\_\_\_\_ Length \_\_\_\_\_

**Part C** Carl added more logs to his stack of wood, increasing the length of the stack by 2 feet and increasing the height of the stack by 3 feet. By how many square feet did the area of the top and all four sides of the stack **increase**? In the space below, show your work and write your answer on the line.

Increase \_\_\_\_\_ square feet

## CSAP Mathematics Scoring Guide

### Item 6:

#### Rubric

#### Exemplary Response

##### *Part A*

- **128** square feet

##### AND

- Long sides =  $(8\text{ft} \times 4\text{ft}) \times 2 = 64 \text{ ft}^2$   
Top =  $8\text{ft} \times 4\text{ft} = 32 \text{ ft}^2$   
Short sides =  $(4\text{ft} \times 4\text{ft}) \times 2 = 32 \text{ ft}^2$   
Surface area plastic sheet must cover =  $64\text{ft}^2 + 32\text{ft}^2 + 32\text{ft}^2 = 128 \text{ ft}^2$

##### OR

- Other valid response

##### *Part B*

- Width **12 (feet)**                      Length **16 (feet)**

**Part C**

- Increase **108** square feet

**AND**

- The new area is:  
Long sides =  $(10\text{ft} \times 7\text{ft}) \times 2 = 140\text{ft}^2$   
Top =  $10\text{ft} \times 4\text{ft} = 40\text{ft}^2$   
Short sides =  $(4\text{ft} \times 7\text{ft}) \times 2 = 56\text{ft}^2$   
Total (new) Area =  $140\text{ft}^2 + 40\text{ft}^2 + 56\text{ft}^2 = 236\text{ft}^2$   
Total Increase in Area =  $236\text{ft}^2 - 128\text{ft}^2 = 108\text{ft}^2$

**OR**

- Other valid response

**Score Points:** Apply 4-point holistic rubric.

**This item appeared at only one grade level.**

**Grade 8**

Standard 4.5a: Geometry and Spatial Sense

Subcontent Area: geometry



Sam will mix together green, blue, and white paint. He mixes 5 pints of green paint and 7 pints of blue paint. He will make the mixture 25 percent white paint.

How many pints of white paint should Sam add to the mixture? In the space below, show your work and write your answer on the line.

$$\begin{array}{r} 125 \\ 205 \\ \hline 100 \end{array}$$

5 pints - green  
7 pints - blue  

---

13 pints

want 25% of white

20 pints of white paint

ok

~~0 Point Backup Anchor~~

PD

4/12/04

0 Pt. Anchor



**Part B** What are the dimensions of the smallest rectangular plastic sheet that can be used to cover the stack of wood? In the space below, show your work and write your answers on the lines.

$$4 + 8 + 4 = 16$$

$$4 * 4 + 4 = 12$$

Width 12                      Length 16

**Part C** Carl added more logs to his stack of wood, increasing the length of the stack by 2 feet and increasing the height of the stack by 3 feet. By how many square feet did the area of the top and all four sides of the stack increase? In the space below, show your work and write your answer on the line.

$$\begin{array}{r} 28 \\ 2 \\ \hline 56 \\ 236 \\ - 129 \\ \hline 108 \end{array}$$

WOOD  
1 - 10 - 1  
7

FR + BK  $10 \times 7 = 70$   
                   $\times 2$

2 si  $4 \times 7 = 28 \times 2$       140

Top = 40 sq ft

2 SIDE = 56 sq ft

FR + BK = 140 sq ft

---

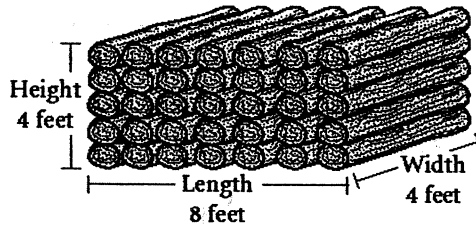
236

Increase 108 square feet

4/12/04  
BA



Carl has a stack of wood with the measurements shown below. He will cover the top and all 4 sides of the stack with a plastic sheet.



**Part A** What is the total surface area the plastic sheet must cover? In the space below, show your work and write your answer on the line.

$front = 32ft^2$   
 $back = 32ft^2$   
 $side R = 16ft^2$   
 $side L = 16ft^2$   
 $top = 32ft^2$

---

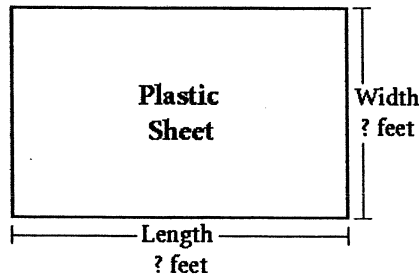
128

---

128

\_\_\_\_\_ square feet

The diagram below represents a plastic sheet with unknown measurements.



4/12/04  
*(Signature)*

**Part B** What are the dimensions of the smallest rectangular plastic sheet that can be used to cover the stack of wood? In the space below, show your work and write your answers on the lines.

Width 4 Length 8

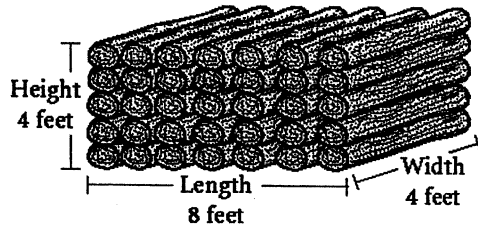
**Part C** Carl added more logs to his stack of wood, increasing the length of the stack by 2 feet and increasing the height of the stack by 3 feet. By how many square feet did the area of the top and all four sides of the stack increase? In the space below, show your work and write your answer on the line.

Front = 70  
 Back = 70  
 Side L = 28  
 Side R = 28  
 Top = 40  
 -----  
 236  
 + 128  
 -----  
 364

Increase 108 square feet

4/12/14  
Be

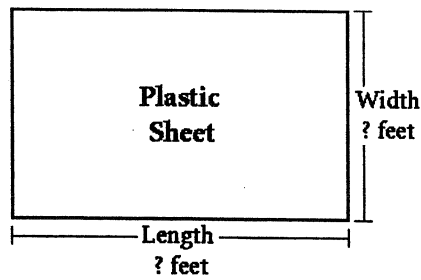
Carl has a stack of wood with the measurements shown below. He will cover the top and all 4 sides of the stack with a plastic sheet.



**Part A** What is the total surface area the plastic sheet must cover? In the space below, show your work and write your answer on the line.

A hand-drawn diagram of a rectangular prism representing the stack of wood. The top face is labeled with  $4 \cdot 8 = 32$ . The front face is labeled with  $4 \cdot 8 = 32$ . The right side face is labeled with  $4 \cdot 4 = 16$ . To the right of the prism is a vertical list of numbers:  $32$ ,  $32$ ,  $32$ ,  $16$ ,  $16$ , and  $128$ . Below the list, the number  $128$  is written on a horizontal line, followed by the text "square feet".

The diagram below represents a plastic sheet with unknown measurements.



~~2 pt Backup Anchor~~

*BA*  
4/12/04

**Part B** What are the dimensions of the smallest rectangular plastic sheet that can be used to cover the stack of wood? In the space below, show your work and write your answers on the lines.

$4 \uparrow$     $8 \rightarrow$     $4 \downarrow$     $t=16$     $76 \overline{)128}$   
 $128$

Width 16 ft.   Length 8 ft. *not a factor.*

**Part C** Carl added more logs to his stack of wood, increasing the length of the stack by 2 feet and increasing the height of the stack by 3 feet. By how many square feet did the area of the top and all four sides of the stack increase? In the space below, show your work and write your answer on the line.

$2 \cdot 4 = 8$   
 $3 \cdot 10 = 30$   
 $\frac{38}{8}$

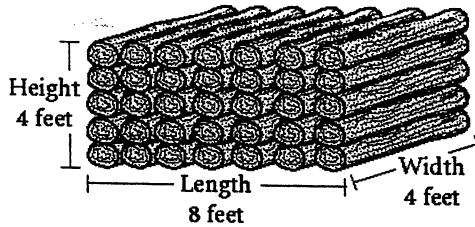
Increase 38 square feet

CSAP 2004   8th Grade Math   Item 60  
 Covering a Stack of Logs  
 Score Point: 2  
 The response lacks adequate evidence of the learning and strategic tools that are needed to complete the task. Part of the task is accomplished.  
 a) correct with work shown  
 b) ~~incorrect~~ part of work correct  
 c) incorrect *needs more instruction*

~~2 pts Backup Anchor~~

*BA 4/12/04*

Carl has a stack of wood with the measurements shown below. He will cover the top and all 4 sides of the stack with a plastic sheet.



**Part A** What is the total surface area the plastic sheet must cover? In the space below, show your work and write your answer on the line.

160

square feet

9

1 4.4 = 16

2 4.4 = 16

3 4.8 = 24

4 4.8 = 24

5 5.4 = 24

6 5.4 = 24

7 5.4 = 24

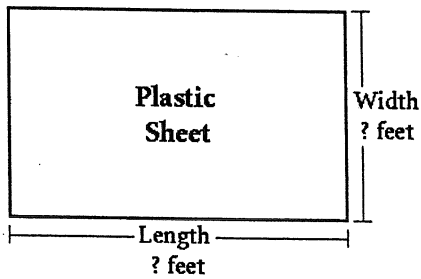
8 5.4 = 24

9 5.4 = 24

Total 160

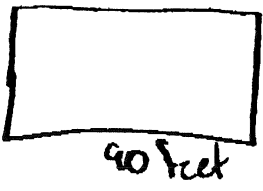
Included bottom

The diagram below represents a plastic sheet with unknown measurements.



1 pt. BJD  
4/12/04  
Anchor

**Part B** What are the dimensions of the smallest rectangular plastic sheet that can be used to cover the stack of wood? In the space below, show your work and write your answers on the lines.



70 feet

90 feet

length is bigger because it's a rectangle

Width 70 feet      Length 90 feet

**Part C** Carl added more logs to his stack of wood, increasing the length of the stack by 2 feet and increasing the height of the stack by 3 feet. By how many square feet did the area of the top and all four sides of the stack increase? In the space below, show your work and write your answer on the line.

3 · 2 = 6

---

Increase 6 square feet

*correctly demonstrates SA but includes SA*

a) makes an attempt at process but includes ~~face~~ ~~side~~

b) incorrect

c) incorrect

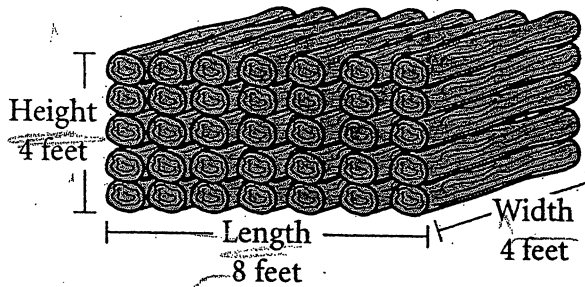
*bottom*

*ft.*

*Anchor*

*[Signature]*  
4/12/04

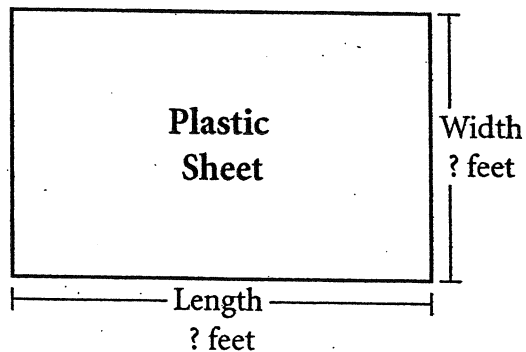
Carl has a stack of wood with the measurements shown below. He will cover the top and all 4 sides of the stack with a plastic sheet.



**Part A** What is the total surface area the plastic sheet must cover? In the space below, show your work and write your answer on the line.

512 \_\_\_\_\_ square feet

The diagram below represents a plastic sheet with unknown measurements.



0 pt Anchor

*BD* 4/12/04

8M-1005

**Part B** What are the dimensions of the smallest rectangular plastic sheet that can be used to cover the stack of wood? In the space below, show your work and write your answers on the lines.

Width 18,00<sup>2</sup> Length 18

**Part C** Carl added more logs to his stack of wood, increasing the length of the stack by 2 feet and increasing the height of the stack by 3 feet. By how many square feet did the area of the top and all four sides of the stack increase? In the space below, show your work and write your answer on the line.

Increase There would now be 56 logs.

0 pt Anchor

*BD* 4/12/04

8M-1005



***2004 CSAP Released Items***

***Grade 9 Mathematics***

7

Paul is interested in buying a new car. The table below shows the prices for the last 8 cars sold by each of two local car dealers.

Dealer A	Dealer B
\$16,500	\$16,150
\$16,450	\$16,000
\$17,200	\$16,400
\$16,200	\$16,950
\$17,400	\$17,250
\$16,050	\$17,250
\$17,000	\$16,200
\$15,850	\$16,500

**Part A** Each dealer claims to have the best prices in town. Show one way that the information in the table can be used to support each dealer's claim. In the space below, show your work. Then write your explanation on the lines on the next page.

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**Part B** Another car dealer, Dealer C, claims that his median price for cars is 5% less than any other car dealer’s median price. Compared to Dealers A and B, what is the median price Dealer C will charge for a car? In the space below, show your work and write your answer on the line.

\$ \_\_\_\_\_

**Item 7:**

**Rubric**

**Exemplary Response**

**Part A**

- Dealer A mean:

$$\frac{(\$16,500 + \$16,450 + \$17,200 + \$16,200 + \$17,400 + \$16,050 + \$17,000 + \$15,850)}{8} = \$16,581.25$$

$$\text{Dealer A median: } \frac{(\$16,500 + \$16,450)}{2} = \$16,475$$

- Dealer B mean:

$$\frac{(\$16,150 + \$16,000 + \$16,400 + \$16,950 + \$17,250 + \$17,250 + \$16,200 + \$16,500)}{8} = \$16,587.50$$

$$\text{Dealer B median: } \frac{(\$16,400 + \$16,500)}{2} = \$16,450$$

**OR**

- Other valid response

**AND**

- Dealer A has a lower mean price.

**OR**

- Dealer A has the lowest price.

**AND**

- Dealer B has a lower median price.

**Part B**

- \$15,627.50

**AND**

- $\$16,450 \times 0.05 = \$822.50$

**AND**

- $\$16,450 - \$822.50 = \$15,627.50$

**OR**

- $\$16,450 \times 0.95 = \$15,627.50$

**OR**

- Other valid process

**Score Points:** Apply 3-point holistic rubric.

**This item appeared at only one grade level.**

**Grade 9**

Standard 3.2c: Data Analysis, Probability, and Statistics

Subcontent Area: not classified

9M-5301

Paul is interested in buying a new car. The table below shows the prices for the last 8 cars sold by each of two local car dealers.

	Dealer A	Dealer B
5	\$16,500 ✓	\$16,150 ✓
4	\$16,450 ✓	\$16,000 ✓
3	\$17,200 ✓	\$16,400 ✓
2	\$16,200 ✓	\$16,950 ✓
1	\$17,400 ✓	\$17,250 ✓
2	\$16,050 ✓	\$17,250 ✓
3	\$17,000 ✓	\$16,200 ✓
4	\$15,850 ✓	\$16,500 ✓

Part A Each dealer claims to have the best prices in town. Show one way that the information in the table can be used to support each dealership's claim. In the space below, show your work. Then write your explanation on the lines.

<p>Dealer A  <math>132650/8</math>  Mean = <math>16581.25</math>  Median = <math>16,475</math></p>	<p>Dealer B  <math>132700/8</math>  Mean = <math>16587.5</math>  Median = <math>16450</math></p>
--	--

Dealer A can claim to have the best prices because they have the best mean.  
 Dealer B can claim to have the best prices because they have the better median.  
 Dealer A actually has the best best prices because they have the better average.

9M-0641

3 pt Anchor

9m 5301a

Part B Another car dealer, Dealer C, claims that his median price for cars is 5% less than any other car dealer's median price. Compared to Dealers A and B, what is the median price Dealer C will charge for a car? In the space below, show your work and write your answer on the line.

<p>Dealer B</p> $\frac{5}{100} = \frac{x}{16450}$ $100x = 82250$ $x = 822.5$ $16450 - 822.5$ $15627.5$ $\$ \underline{15630.38}$	<p>Dealer A</p> $\frac{5}{100} = \frac{x}{16475}$ $100x = 82375$ $x = 823.75$ $16475 - 823.75$ $15651.25$
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3MB

9m-0041a

9M-5302



Paul is interested in buying a new car. The table below shows the prices for the last 8 cars sold by each of two local car dealers.

Dealer A	Dealer B
\$16,500	\$16,150
\$16,450	\$16,000
\$17,200	\$16,400
\$16,200	\$16,950
\$17,400	\$17,250
\$16,050	\$17,250
\$17,000	\$16,200
\$15,850	\$16,500

Part A Each dealer claims to have the best prices in town. Show one way that the information in the table can be used to support each dealership's claim. In the space below, show your work. Then write your explanation on the lines.

16,500	>	16,150
16,450	>	16,000
17,200	>	16,400
16,200	<	16,950
17,400	>	17,250
16,050	<	17,250
17,000	>	16,200
15,850	<	16,500

*Comparison*

It shows that it depends on the car because for some of the car Dealer A's car is more expensive than dealer B's, but for others it is Dealer B's cars which are more expensive.

9M-0042

2 pt Anchor



9M-5302a

Part B Another car dealer, Dealer C, claims that his median price for cars is 5% less than any other car dealer's median price. Compared to Dealers A and B, what is the median price Dealer C will charge for a car? In the space below, show your work and write your answer on the line.

A = 15,850; 16,050; 16,200; 16,450; 16,500; 17,000; 17,200; 17,400

B = 16,000; 16,150; 16,200; 16,400; 16,500; 16,950; 17,250; 17,300

$$\begin{array}{r} 16,450 \\ - \quad 5\% \\ \hline 15,627.50 \end{array}$$

$$\begin{array}{r} 16,450 \\ - \quad .05 \\ \hline 822.5 \end{array}$$

$$\begin{array}{r} 16,450 \\ - \quad 822.5 \\ \hline 15,627.50 \end{array}$$

\$ 15,627.50

*[Handwritten signature]*

9M-0042a

9M-5303

Paul is interested in buying a new car. The table below shows the prices for the last 8 cars sold by each of two local car dealers.

Dealer A	Dealer B
\$16,500	\$16,150
\$16,450	\$16,000
\$17,200	\$16,400
\$16,200	\$16,950
\$17,400	\$17,250
\$16,050	\$17,250
\$17,000	\$16,200
\$15,850	\$16,500

131,800

115,450

**Part A** Each dealer claims to have the best prices in town. Show one way that the information in the table can be used to support each dealership's claim. In the space below, show your work. Then write your explanation on the lines.

total Amount of money made for:  
 Dealer A = \$131,800 Dealer B = \$115,450  
 Amount of difference = \$16,350

Dealer B has better prices than Dealer A. This shows just by looking at the purchases of the 8 cars and comparing the two, and by adding up all the money that was made. Dealer B made about 1/2 as much as A.

9M-0043

1 pt Anchor

9M-5303a

Part B Another car dealer, Dealer C, claims that his median price for cars is 5% less than any other car dealer's median price. Compared to Dealers A and B, what is the median price Dealer C will charge for a car? In the space below, show your work and write your answer on the line.

$\begin{array}{r} \text{Dealer B} = 16,950 \\ + 17,250 \\ \hline 34,200 \end{array}$	$34,200 \div 2 = 17,100$
$\begin{array}{r} \text{Dealer A} = 33,600 \\ \div 2 = 16,800 \end{array}$	$17,100 \times .05 = 855$
$\begin{array}{r} 16,200 \\ + 17,400 \\ \hline 33,600 \end{array}$	$16,800 \times .05 = 840$
$\$ \underline{\quad 847.5 \quad}$	

*[Handwritten signature]*

9M-0043a

9M-5364



Paul is interested in buying a new car. The table below shows the prices for the last 8 cars sold by each of two local car dealers.

	Dealer A	Dealer B
	\$16,500	\$16,150
50	\$16,450	\$16,000
-750	\$17,200	\$16,400
1000	\$16,200	\$16,950
-1200	\$17,400	\$17,250
1350	\$16,050	\$17,250
-950	\$17,000	\$16,200
1150	\$15,850	\$16,500

Part A Each dealer claims to have the best prices in town. Show one way that the information in the table can be used to support each dealership's claim. In the space below, show your work. Then write your explanation on the lines.

a	b
1	difference = 350
2	450
3	800
4	750
5	150
6	200
7	800
8	650

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9M-0044  
Opt Anchor

9M 5304a

**Part B** Another car dealer, Dealer C, claims that his median price for cars is 5% less than any other car dealer's median price. Compared to Dealers A and B, what is the median price Dealer C will charge for a car? In the space below, show your work and write your answer on the line

\$ \_\_\_\_\_

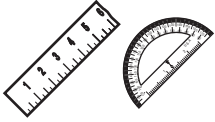
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9M-0044a

***2004 CSAP Released Items***

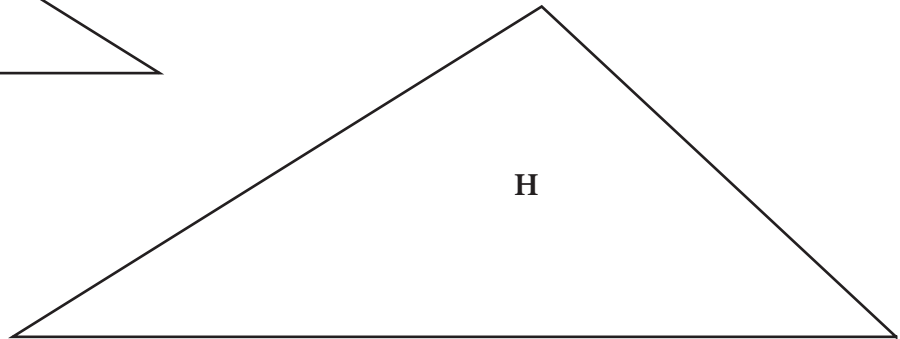
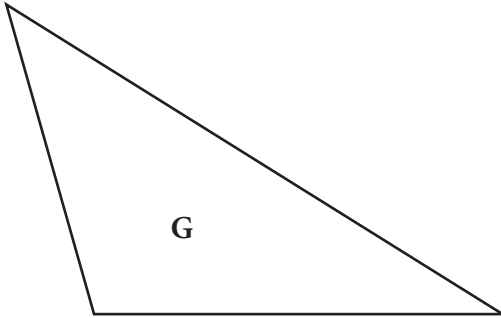
***Grade 10 Mathematics***

8



Use your punch-out tools to help you solve this problem.

Study Triangle G and Triangle H below.



Are the triangles similar? Write your answer on the line. \_\_\_\_\_

In the space below, explain whether or not the triangles are similar. Use measurements to justify your answer and label the triangles with the measurements you used.

**Item 8:**

**Rubric**

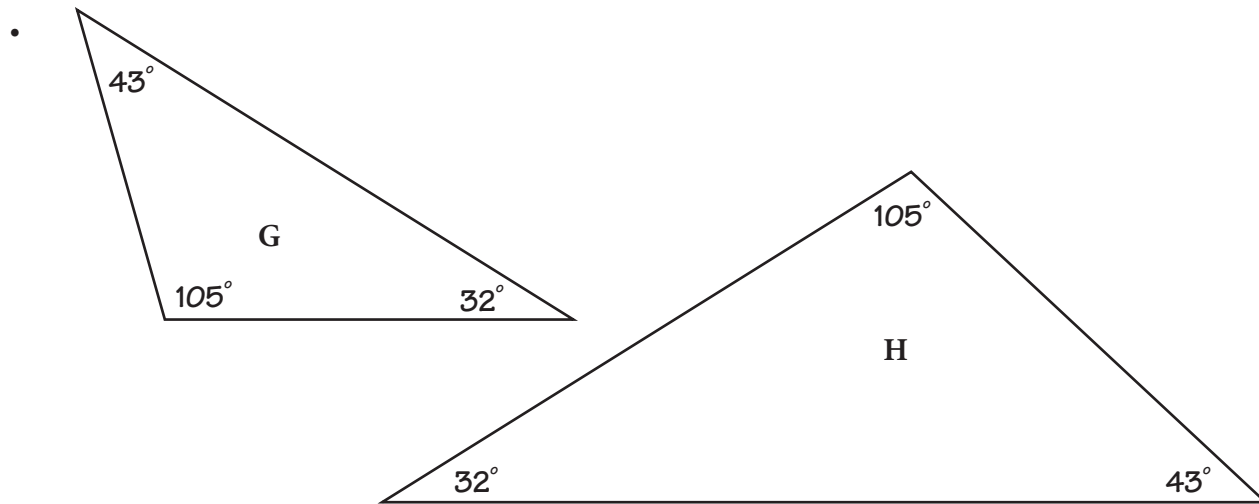
**Exemplary Response**

- Are the triangles similar? **Yes**

**AND**

- I measured the angles of both triangles. The angle measures in each triangle are the same, so the triangles are similar.

**AND**

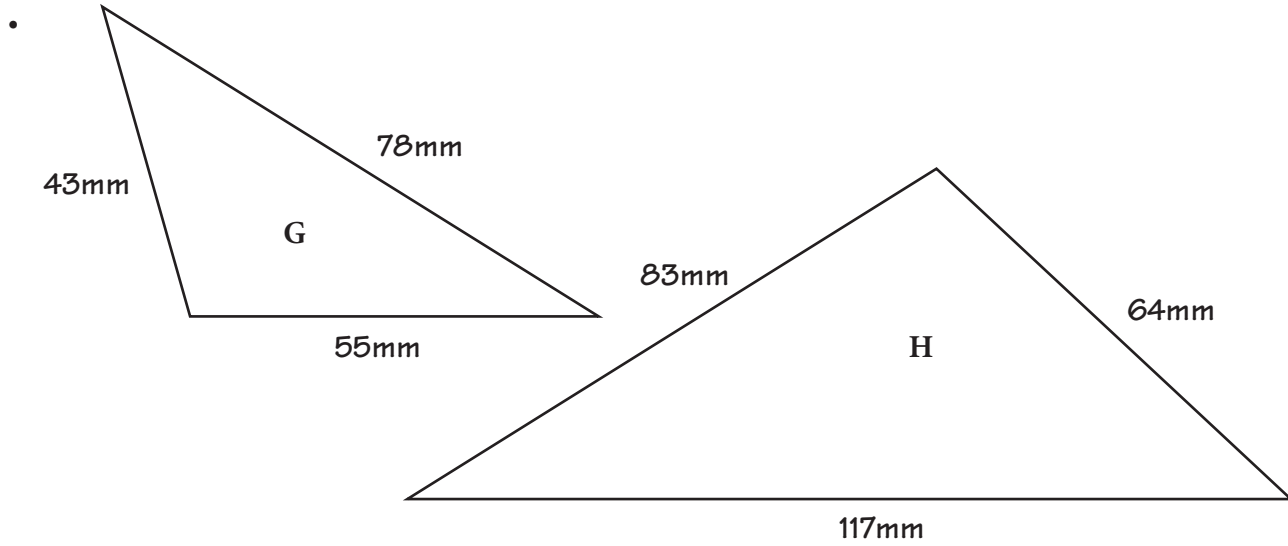


**OR**

- I measured the lengths of each of the sides of both triangles. Each side of Triangle H was 1.5 times the length of the corresponding side of Triangle G, so the triangles are similar.



AND



OR

- Other valid response based on accepted similarity proofs (AA, SSS, ASA, SAS) with corresponding labels on the triangles

**Score Points:** Apply 2-point holistic rubric.

**This item appeared at only one grade level.**

**Grade 10**

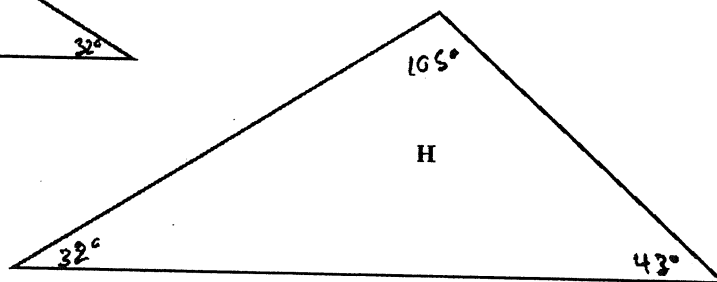
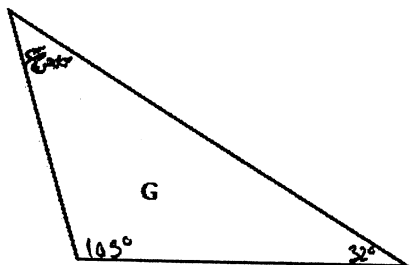
Standard 4.3a: Geometry and Spatial Sense

Subcontent Area: not classified



Use your punch-out tools to help you solve this problem.

Study Triangle G and Triangle H below.



Are the triangles similar? Write your answer on the line. Yes

In the space below, explain whether or not the triangles are similar. Use measurements to justify your answer and label the triangles with the measurements you used.

$\triangle G$  is similar to  $\triangle H$  because they have the same  $\angle$  measurements compared to each other by AAA.

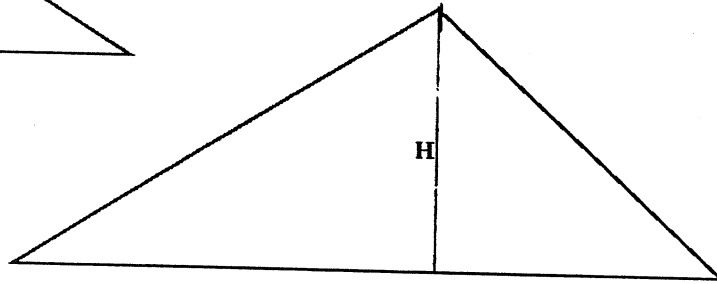
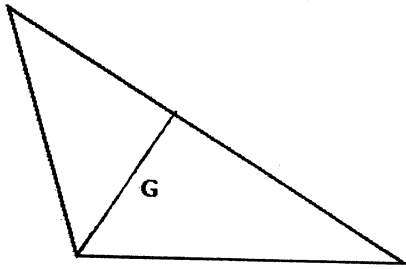
The diagram shows two triangles side-by-side. The left triangle is labeled with angles  $43^\circ$  at the top,  $105^\circ$  at the bottom-left, and  $32^\circ$  at the bottom-right. The right triangle is labeled with angles  $43^\circ$  at the top,  $105^\circ$  at the bottom-left, and  $32^\circ$  at the bottom-right.

KK  
8/12



Use your punch-out tools to help you solve this problem.

Study Triangle G and Triangle H below.



Are the triangles similar? Write your answer on the line. yes

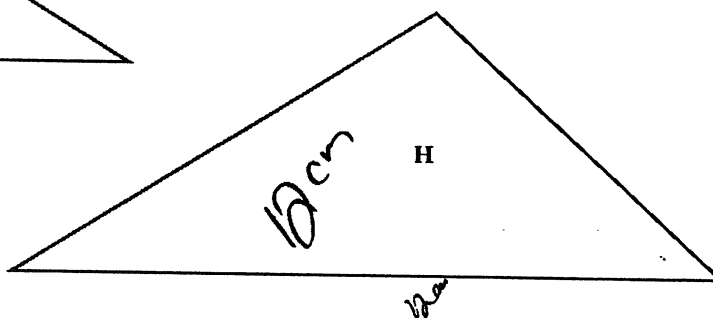
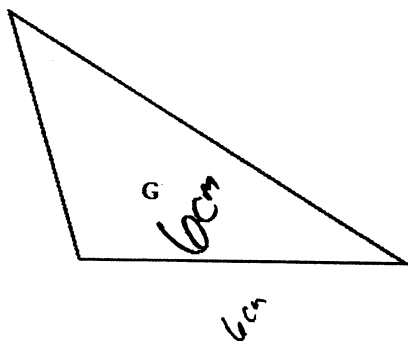
In the space below, explain whether or not the triangles are similar. Use measurements to justify your answer and label the triangles with the measurements you used.

The triangles are similar because their angles have the same measurements.



Use your punch-out tools to help you solve this problem.

Study Triangle G and Triangle H below.



Are the triangles similar? Write your answer on the line.

NO

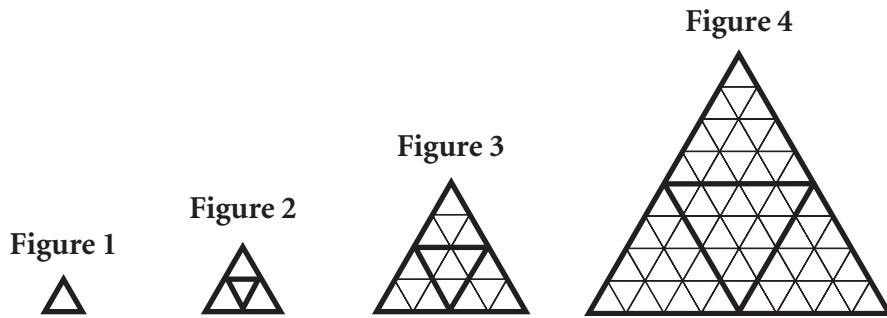
In the space below, explain whether or not the triangles are similar. Use measurements to justify your answer and label the triangles with the measurements you used.

Triangle H = 12cm  
Triangle G = 6cm  
Triangle G =  $\frac{1}{2}$  OF H  
NO

***2004 CSAP Released Items***

***Grade 10 Mathematics***

- 9 Each figure in the pattern below is made from equilateral triangles with sides that are 1 unit in length.



Part A Complete the table below to show the perimeter and area of each figure.

Figure	Perimeter	Area
1	3	$\frac{1}{4}\sqrt{3}$
2	6	$\sqrt{3}$
3	12	$4\sqrt{3}$
4		
5		
6		
7		

**Part B** On the lines below, describe the pattern of change in the perimeters of the figures.

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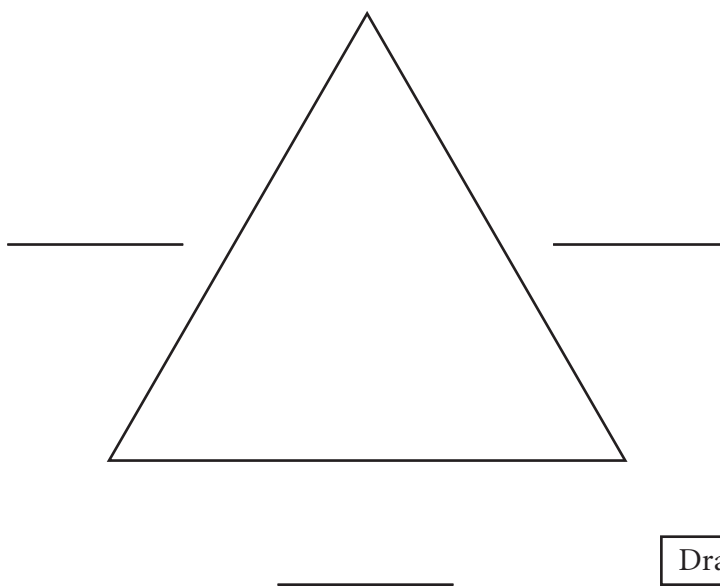
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**Part C** The outline of Figure 12 is shown below. Label the lengths of each side on the lines provided.

**Figure 12**



**Part D** Find the perimeter and area of Figure 12. On the lines below, write your answers.

Perimeter \_\_\_\_\_ Area \_\_\_\_\_

**Part E** On the lines below, explain how you found the area of Figure 12.

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**Item 9:**

**Rubric**

**Exemplary Response**

**Part A**

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Figure	Perimeter	Area
1	3	$\frac{1}{4}\sqrt{3}$
2	6	$\sqrt{3}$
3	12	$4\sqrt{3}$
4	<b>24</b>	<b><math>16\sqrt{3}</math></b>
5	<b>48</b>	<b><math>64\sqrt{3}</math></b>
6	<b>96</b>	<b><math>256\sqrt{3}</math></b>
7	<b>192</b>	<b><math>1024\sqrt{3}</math></b>

**Part B**

- The difference between each perimeter is the same as the previous perimeter. This pattern causes the perimeter of every figure to double.

**OR**

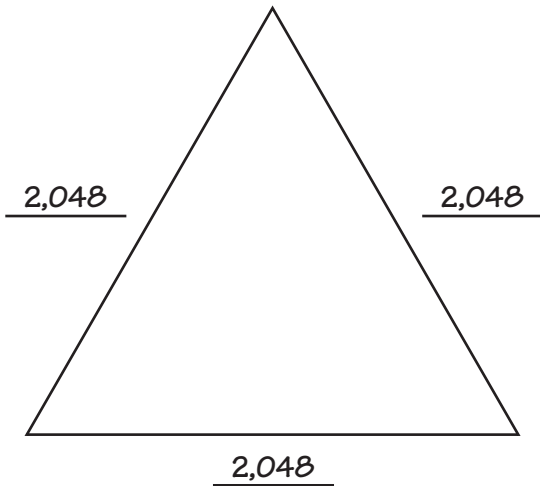
- Other valid explanation



**Part C**

- 

**Figure 12**



**Part D**

- Perimeter  $6,144$                       Area  $1,048,576\sqrt{3}$

**Part E**

- The areas of the triangles increase by a factor of 4 each time. To get the area of the next triangle, I just multiplied the previous triangle's area times 4. Since the area of Figure 7 was  $1,024\sqrt{3}$ , I just multiplied that by 4 five times.

**OR**

- Other valid explanations

**Score Points:** Apply 4-point holistic rubric.

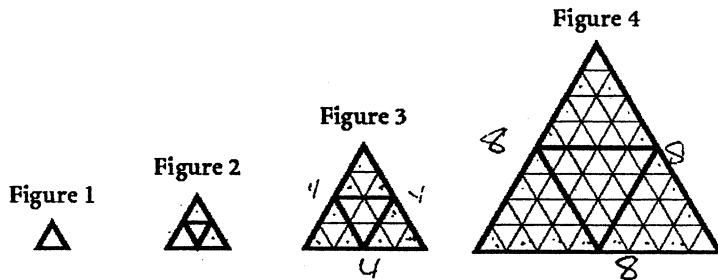
**This item appeared at only one grade level.**

**Grade 10**

Standard 2.2a: Patterns, Functions, and Algebra

Subcontent Area: not classified

Each figure in the pattern below is made from equilateral triangles with sides that are 1 unit in length.



Part A Complete the table below to show the perimeter and area of each figure.

Figure	Perimeter	Area
1	3	$\frac{1}{4}\sqrt{3}$
2	6	$\sqrt{3}$
3	12	$4\sqrt{3}$
4	24	$16\sqrt{3}$
5	48	$64\sqrt{3}$
6	96	$256\sqrt{3}$
7	192	$1024\sqrt{3}$

Handwritten calculations for area:

$$\begin{array}{r} 148 \\ 2 \\ \hline 196 \\ 2 \\ \hline 192 \end{array}$$

$$\begin{array}{r} 216 \\ 4 \\ \hline 64 \\ 4 \\ \hline 2756 \\ 4 \\ \hline 11024 \\ 4 \\ \hline 44096 \\ 4 \\ \hline 176384 \\ 4 \\ \hline 65536 \end{array}$$

Part B On the lines below, describe the pattern of change in the perimeters of the figures.

The perimeter of the figures double from the figure above it. You multiply by 2.

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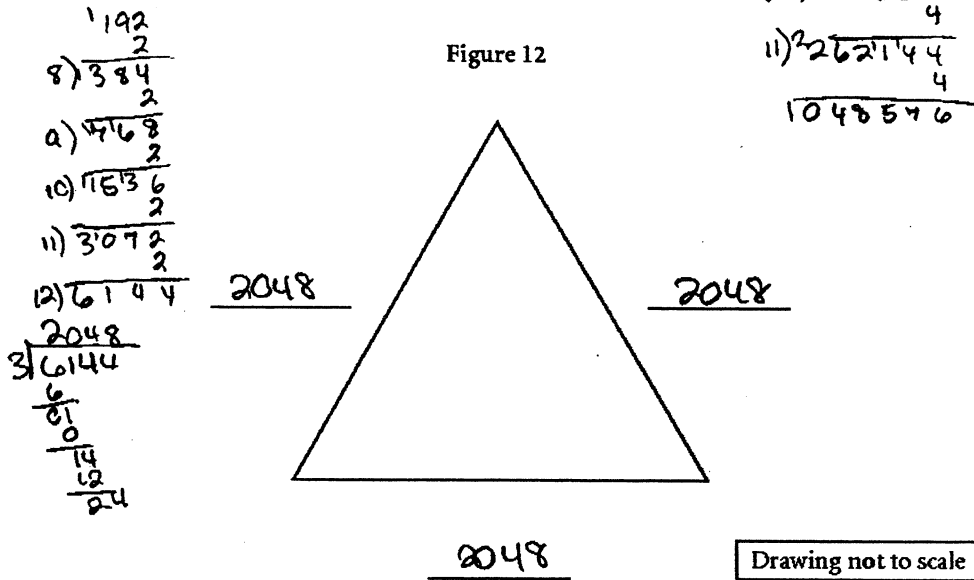
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Handwritten signature and date: 4/12

Part C The outline of Figure 12 is shown below. Label the lengths of each side on the lines provided.



Part D Find the perimeter and area of Figure 12. On the lines below, write your answers.

Perimeter 6144 Area 1048576

Part E On the lines below, explain how you found the area of Figure 12.

I just kept multiplying by 4.

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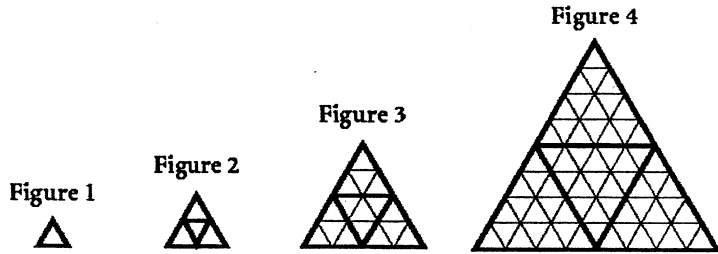


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Each figure in the pattern below is made from equilateral triangles with sides that are 1 unit in length.



Handwritten calculations for perimeter and area:

$$\begin{array}{r} 1\sqrt{3} \\ +1\sqrt{3} \\ +1\sqrt{3} \\ \hline 4\sqrt{3} \end{array}$$

Part A Complete the table below to show the perimeter and area of each figure.

Handwritten calculations for perimeter and area:

$$\begin{array}{r} 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20 \\ 21 \\ 22 \\ 23 \\ 24 \\ 25 \\ 26 \\ 27 \\ 28 \\ 29 \\ 30 \\ 31 \\ 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 40 \\ 41 \\ 42 \\ 43 \\ 44 \\ 45 \\ 46 \\ 47 \\ 48 \\ 49 \\ 50 \\ 51 \\ 52 \\ 53 \\ 54 \\ 55 \\ 56 \\ 57 \\ 58 \\ 59 \\ 60 \\ 61 \\ 62 \\ 63 \\ 64 \\ 65 \\ 66 \\ 67 \\ 68 \\ 69 \\ 70 \\ 71 \\ 72 \\ 73 \\ 74 \\ 75 \\ 76 \\ 77 \\ 78 \\ 79 \\ 80 \\ 81 \\ 82 \\ 83 \\ 84 \\ 85 \\ 86 \\ 87 \\ 88 \\ 89 \\ 90 \\ 91 \\ 92 \\ 93 \\ 94 \\ 95 \\ 96 \\ 97 \\ 98 \\ 99 \\ 100 \end{array}$$

Figure	Perimeter	Area
1	3	$\frac{1}{4}\sqrt{3}$
2	6	$\sqrt{3}$
3	12	$4\sqrt{3}$
4	24	$16\sqrt{3}$
5	48	$64\sqrt{3}$
6	96	$256\sqrt{3}$
7	192	$1024\sqrt{3}$

Handwritten calculations for perimeter and area:

$$\begin{array}{r} 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20 \\ 21 \\ 22 \\ 23 \\ 24 \\ 25 \\ 26 \\ 27 \\ 28 \\ 29 \\ 30 \\ 31 \\ 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 40 \\ 41 \\ 42 \\ 43 \\ 44 \\ 45 \\ 46 \\ 47 \\ 48 \\ 49 \\ 50 \\ 51 \\ 52 \\ 53 \\ 54 \\ 55 \\ 56 \\ 57 \\ 58 \\ 59 \\ 60 \\ 61 \\ 62 \\ 63 \\ 64 \\ 65 \\ 66 \\ 67 \\ 68 \\ 69 \\ 70 \\ 71 \\ 72 \\ 73 \\ 74 \\ 75 \\ 76 \\ 77 \\ 78 \\ 79 \\ 80 \\ 81 \\ 82 \\ 83 \\ 84 \\ 85 \\ 86 \\ 87 \\ 88 \\ 89 \\ 90 \\ 91 \\ 92 \\ 93 \\ 94 \\ 95 \\ 96 \\ 97 \\ 98 \\ 99 \\ 100 \end{array}$$

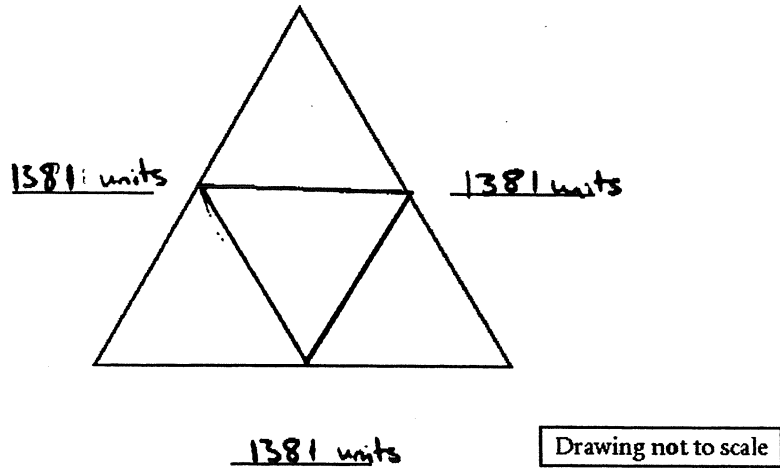
Part B On the lines below, describe the pattern of change in the perimeters of the figures.

The pattern of change in perimeters of the figures is 2. For example, figure 3's perimeter is 12, for figure 4's perimeter is  $12 \times 2 = 24$ . This is the way for all perimeters for these figures.

Handwritten initials and date: 4/12

**Part C** The outline of Figure 12 is shown below. Label the lengths of each side on the lines provided.

Figure 12



**Part D** Find the perimeter and area of Figure 12. On the lines below, write your answers.

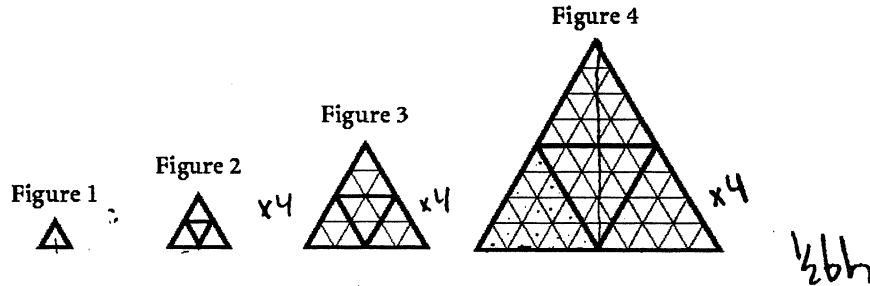
Perimeter 4144      Area 1058816

**Part E** On the lines below, explain how you found the area of Figure 12.

I found the area for by using the same pattern  
as I used before by multiplying the area of the  
figure before by 4.

~~14/12~~

Each figure in the pattern below is made from equilateral triangles with sides that are 1 unit in length.



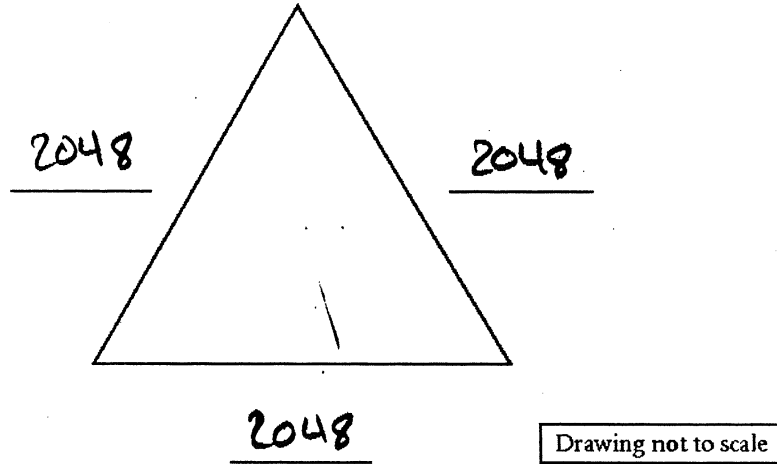
Part A Complete the table below to show the perimeter and area of each figure.

Figure	Perimeter	Area
1	3	$\frac{1}{4}\sqrt{3}$
2	6	$\sqrt{3}$
3	12	$4\sqrt{3}$
4	24	24
5	48	48
6	96	96
7	192	192

Handwritten calculations and notes around the table include:  
 - To the left of the table:  $48 \times 4 = 192$   
 - To the right of the table: A vertical list of numbers 8, 9, 10, 11, 12, 12, 6, 7, 192, 384, 768, 1536, 3072, 6144, 12288, 24576, 49152, 98304, 196608, 393216, 786432, 1572864, 3145728, 6291456, 12582912, 25165824, 50331648, 100663296, 201326592, 402653184, 805306368, 1610612736, 3221225472, 6442450944, 12884901888, 25769803776, 51539607552, 103079215104, 206158430208, 412316860416, 824633720832, 1649267441664, 3298534883328, 6597069766656, 13194139533312, 26388279066624, 52776558133248, 105553116266496, 211106232532992, 422212465065984, 844424930131968, 1688849860263936, 3377699720527872, 6755399441055744, 13510798882111488, 27021597764222976, 54043195528445952, 108086391056891904, 216172782113783808, 432345564227567616, 864691128455135232, 1729382256910270464, 3458764513820540928, 6917529027641081856, 13835058055282163712, 27670116110564327424, 55340232221128654848, 110680464442257309696, 221360928884514619392, 442721857769029238784, 885443715538058477568, 1770887431076116955136, 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Part C The outline of Figure 12 is shown below. Label the lengths of each side on the lines provided.

Figure 12



Part D Find the perimeter and area of Figure 12. On the lines below, write your answers.

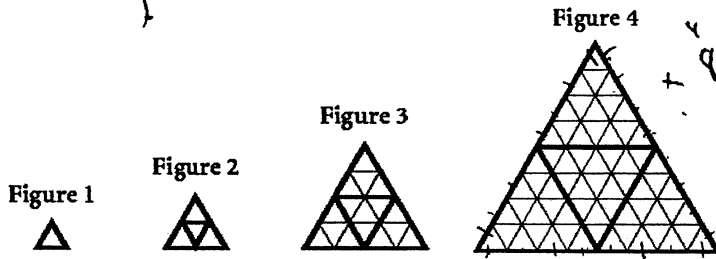
Perimeter 6144 Area ?  $1024 \times 2048$

Part E On the lines below, explain how you found the area of Figure 12.

I didn't  $\frac{1}{2} b \times h$ ,  $1024 \times 2048$   
   
   
 

10M-5232a

Each figure in the pattern below is made from equilateral triangles with sides that are 1 unit in length.



Part A Complete the table below to show the perimeter and area of each figure.

Figure	Perimeter	Area
1	3	$\frac{1}{4}\sqrt{3}$
2	6	$\sqrt{3}$
3	12	$4\sqrt{3}$
4	24	$16\sqrt{3}$
5	48	$64\sqrt{3}$
6	96	$256\sqrt{3}$
7	192	$1024\sqrt{3}$

Handwritten calculations on the left side of the table:

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 48 \\ \times 2 \\ \hline 96 \\ \times 2 \\ \hline 192 \end{array}$$

Part B On the lines below, describe the pattern of change in the perimeters of the figures.

The perimeter of the triangle always  
 doubled.

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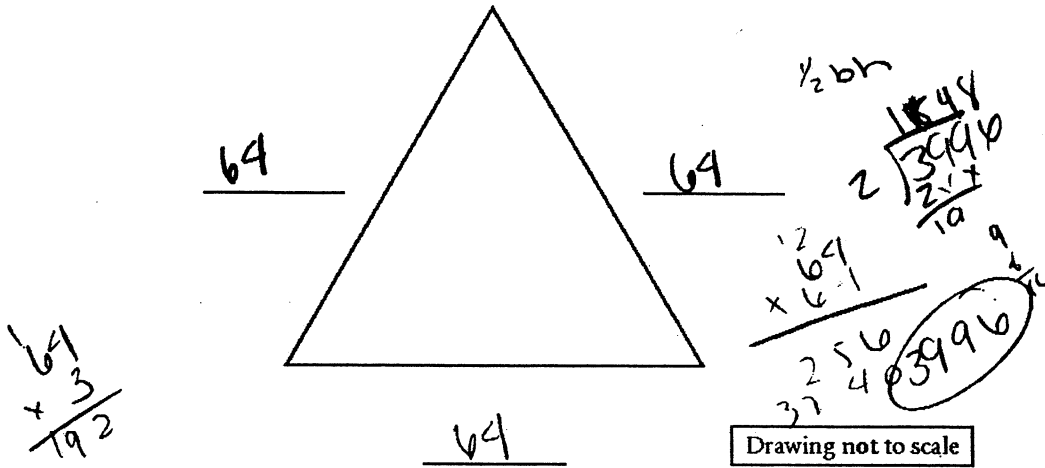


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Part C The outline of Figure 12 is shown below. Label the lengths of each side on the lines provided.

Figure 12



Part D Find the perimeter and area of Figure 12. On the lines below, write your answers.

Perimeter 192 Area 1848

Part E On the lines below, explain how you found the area of Figure 12.

I multiplied the base and the height then divided it by 2

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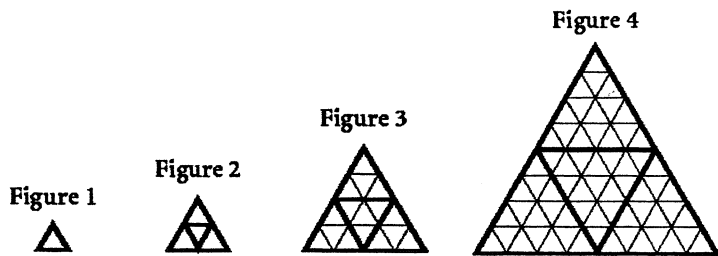


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Each figure in the pattern below is made from equilateral triangles with sides that are 1 unit in length.



Part A Complete the table below to show the perimeter and area of each figure.

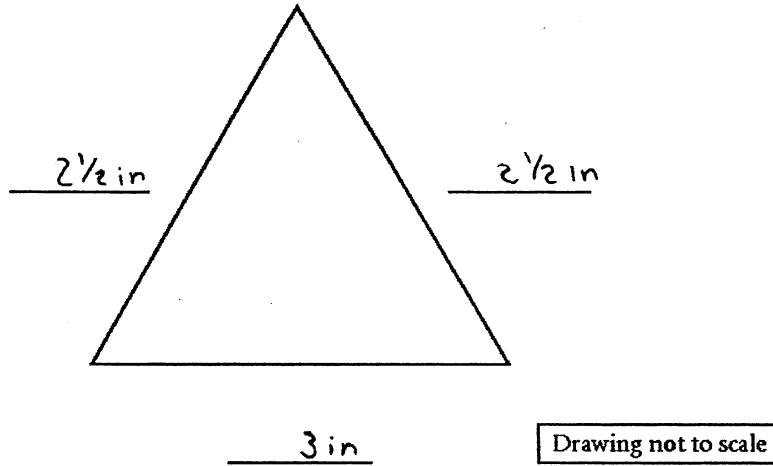
Figure	Perimeter	Area
1	3	$\frac{1}{4}\sqrt{3}$
2	6	$\sqrt{3}$
3	12	$4\sqrt{3}$
4	15	$\sqrt{4}$
5	18	$5\sqrt{4}$
6	21	$\sqrt{5}$
7	24	$6\sqrt{5}$

Part B On the lines below, describe the pattern of change in the perimeters of the figures.

the perimeter and the area  
 both go up 3 times of  
 what they were.

**Part C** The outline of Figure 12 is shown below. Label the lengths of each side on the lines provided.

Figure 12



**Part D** Find the perimeter and area of Figure 12. On the lines below, write your answers.

Perimeter 13 in      Area  $6\frac{1}{2}$  in

**Part E** On the lines below, explain how you found the area of Figure 12.

you do length times the width  
so you go  $3 \times 2\frac{1}{2}$  so its  $6\frac{1}{2}$  in