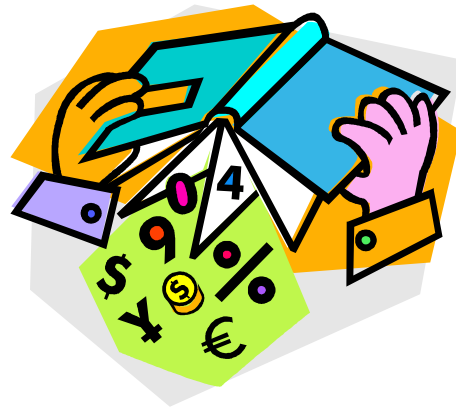


SUMMER PACKET

FOR STUDENTS GOING INTO:
INTEGRATED MATH TOPICS 3
(REVIEWS CONCEPTS TAUGHT IN IMT2)



NAME: _____

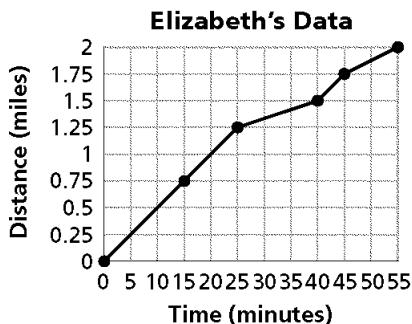
IF THERE ISN'T ENOUGH SPACE, DO YOUR WORK ON A SEPARATE
PIECE OF PAPER AND ATTACH IT TO THIS PACKET. YOU WILL
SUBMIT THE FINISHED PACKET TO YOUR IMT3 TEACHER DURING
THE 1ST WEEK OF SCHOOL

Variables and Patterns

1. The table shows some data Carmen collected during her swim team practice.

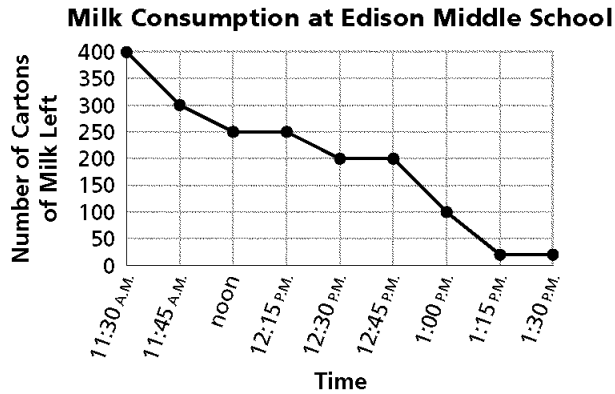
Number of breaths	0	1	2	3	4	5	6	7
Number of meters swum	0	5	8	12	15	17	20	24

- What are the two variables?
 - Graph the data from the table on a separate piece of paper.
 - Does it make sense to connect the points? Explain your reasoning.
 - When did Carmen make the most progress?
 - How does this show up in the table?
 - How does this show up in the graph?
 - When did Carmen make the least progress?
 - How does this show up in the table?
 - How does this show up in the graph?
 - How many breaths do you think she would take if she swam 50 meters?
2. The graph below shows data that Elizabeth collected while walking.



- When does she make the most progress? Explain your reasoning.
- When does she make the least progress? Explain your reasoning.

3. Each day the cafeteria workers at Edison Middle School start out with 400 cartons of milk. They collected some data and made the following graph.



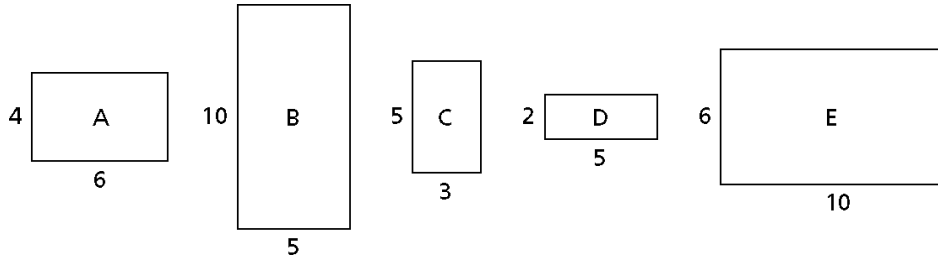
- What is the total number of cartons of milk sold?
- How many cartons were sold between noon and 12:30 p.m.?
- During what 15-minute time period(s) was the most milk sold?
- During what 15-minute time period(s) was the least amount of milk sold?
- Describe how the total number of cartons of milk available changed as the day progressed.
- Should the cafeteria workers have connected the points? Explain.

Stretching and Shrinking

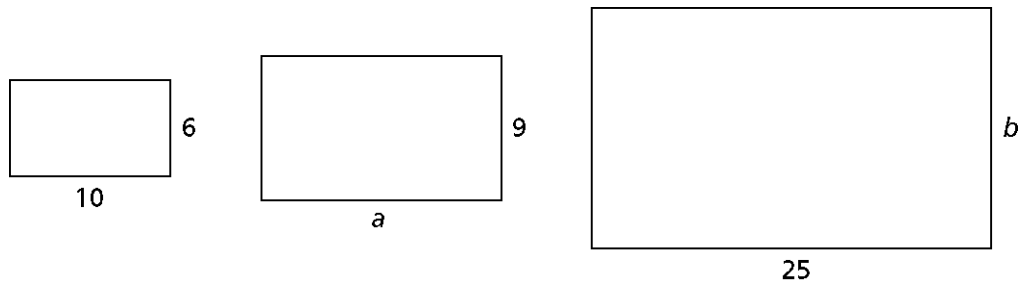
4. The ratio of two adjacent sidelengths of a rectangle is $\frac{2}{3}$. Which of these could be the ratio of two adjacent sidelengths of a similar rectangle? Explain your choice.

$$\frac{4}{9} \quad \frac{4}{3} \quad \frac{2}{6} \quad \frac{4}{5} \quad \frac{6}{9}$$

5. Which of the following rectangles is similar to a 10 by 15 rectangle?

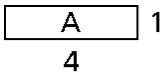


6. The three rectangles below are similar. Find the missing measurements.



$a = \underline{\hspace{2cm}}$ $b = \underline{\hspace{2cm}}$

7. Complete the table below.



Rectangle	Scale Factor	Short Side	Long Side	Perimeter	Area
A	1	1	4		
B	3				
C	10				
D	$\frac{1}{2}$				

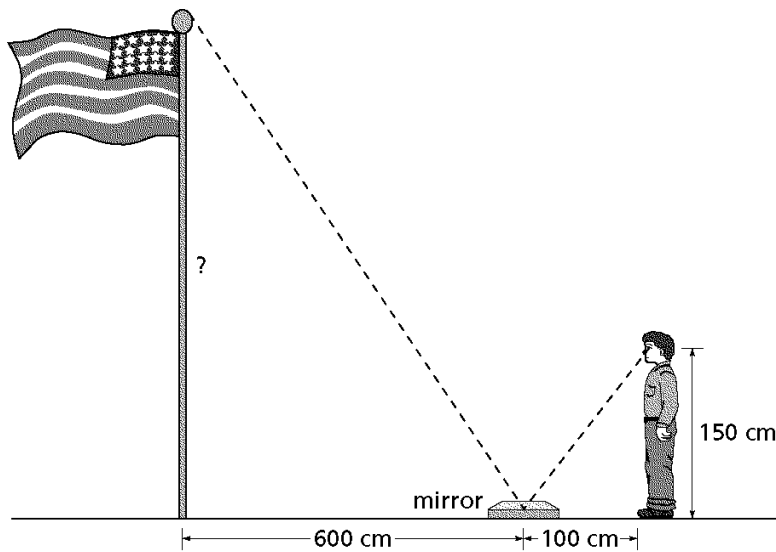
8. If two figures are similar, which of the following *might* be different? Circle your answers, and explain each choice you make.

number of sides
 lengths of corresponding sides
 shape

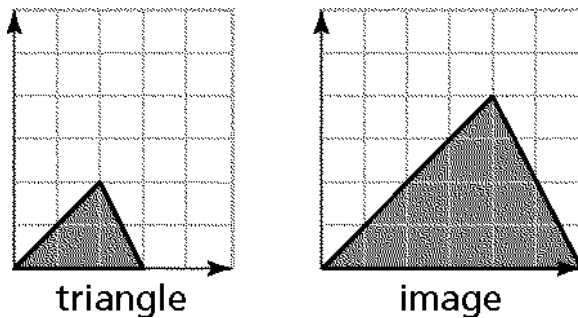
size of angles
 ratio of corresponding sides
 area

9. A rectangle has dimensions of 1 and 6. Another rectangle was drawn from it using a scale factor of 1.5.
- The area of the large rectangle is how many times the area of the small rectangle?
 - The perimeter of the large rectangle is how many times the perimeter of the small rectangle?

10. Gerald wanted to find the height of the flagpole at the entrance to his school. He used a mirror and recorded some measurements on a drawing. What is the height of the flagpole?



11. Below is a triangle and its image.

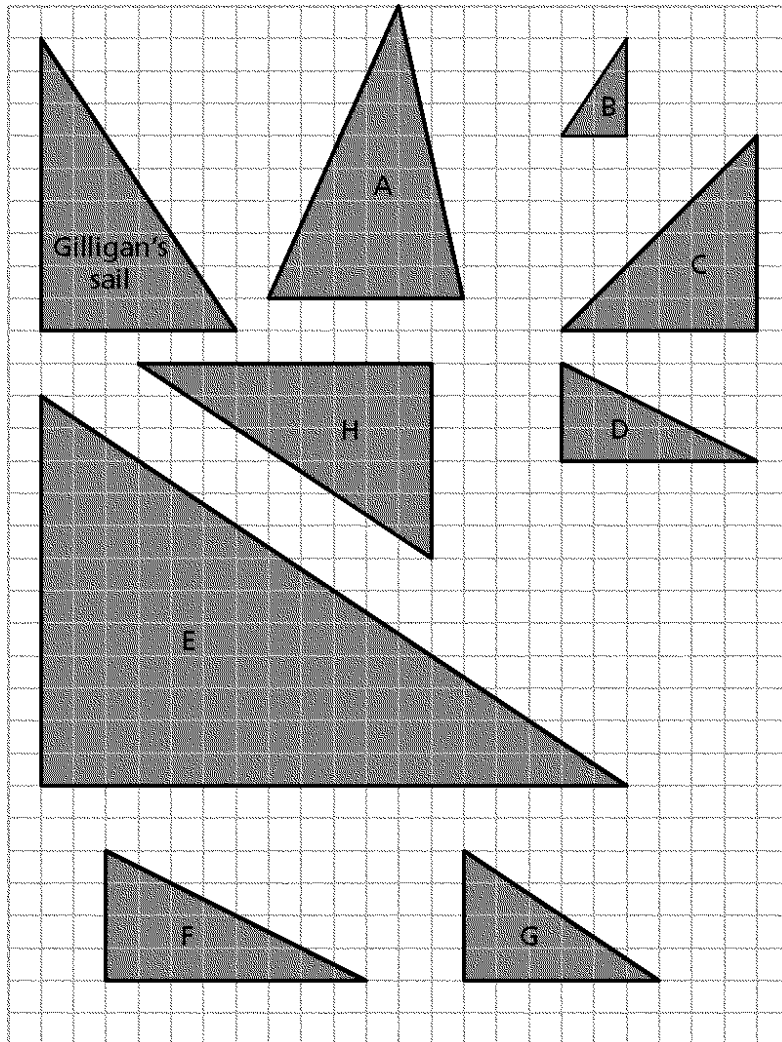


- a. Which of these rules was used to make the image?

$(2x, 2y)$ $(x, 2y)$ $(2x, y)$ $(2x, 4y)$ $(4x, 2y)$

- b. Are the triangle and its image similar? Explain.

12. Gilligan belongs to the Model Sailboat Club. All club members have *similar* boats with *similar* sails. Find all the triangles below that could be used as sails by the club members. Explain your reasoning.



Comparing and Scaling

13. *Donuts4U* has donuts on sale at 12 for \$5.40. Find the unit rates that answer the following questions:
- What is the cost per donut?
 - How many donuts can you buy for a dollar?

14. Find a value of x that will make each proportion true.

a. $\frac{2}{3} = \frac{x}{24}$

b. $\frac{3}{4} = \frac{18}{x}$

c. $\frac{x}{5} = \frac{4}{20}$

d. $\frac{6}{10} = \frac{x}{15}$

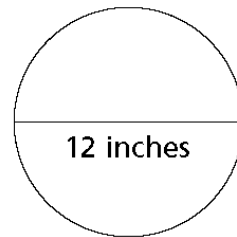
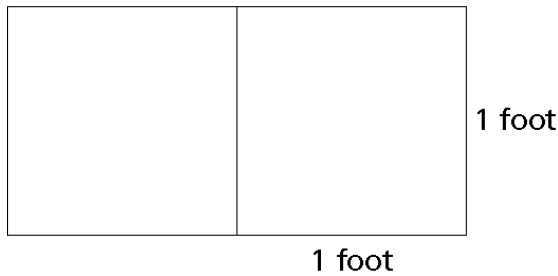
e. $\frac{12}{16} = \frac{x}{20}$

f. $\frac{8}{12} = \frac{14}{x}$

15. Pentominoes Pizza introduced a new pizza called the Giant Foot to compete with Wee Czar's 2-pizzas-for-the-price-of-1 offer. The Giant Foot is two 1-square-foot pizzas put together. Pentominoes' ad claims that the Giant Foot is 25% larger than two Wee Czar's 12-inch round pizzas. A Giant Foot costs \$8.99. Two 12-inch round pizzas from Wee Czar's cost \$8.88.

Pentominoes Giant Foot Pizza

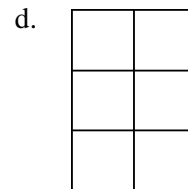
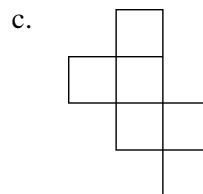
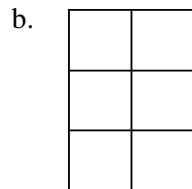
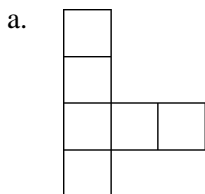
Wee Czar's 12-inch Pizza



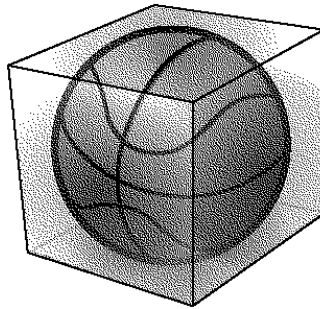
- Which offer gives you more pizza for your money?
- Is the Giant Foot 25% larger than two 12-inch round pizzas from Wee Czar's? If so, prove it. If not, use percents to show how they really compare.

Filling and Wrapping

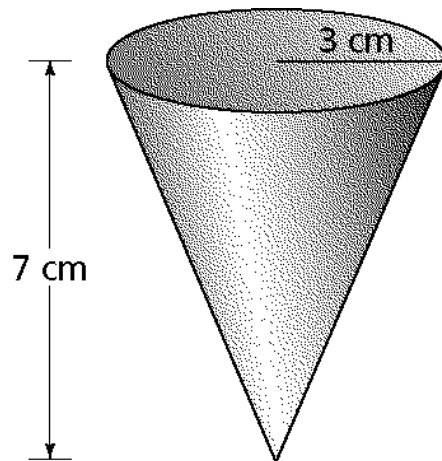
16. Could each of the flat patterns below be folded along the lines to form a box? If yes, explain how. If no, explain why not.



17. One face of a cube has an area of 25 cm^2 .
- What is the surface area of the cube?
 - What is the volume of the cube?
18. Sterling Sports manufactures high-quality basketballs. They package their basketballs in 1-cubic-foot cardboard boxes. The basketballs fit nicely in the boxes, just touching the sides. To keep the ball from being damaged, Sterling fills the empty space in the box with foam. How much foam is put in each basketball box?



19. Make a sketch of a rectangular box with a base of 3 ft by 5 ft by 5 ft and a height of 7 ft.
- How many unit cubes would fit in a single layer at the bottom of the box?
 - How many identical layers of unit cubes could be stacked in the box?
 - What is the volume of the box?
20. Cement is sold by the cubic yard. A cubic yard of cement is the amount of cement that would fit into a box yd long, 1 yd wide, and 1 yd high. How many cubic yards of cement are needed to make a rectangular patio 9 yd long, $6\frac{1}{2}$ yd wide and 6 in. ($\frac{1}{6}$ yd) thick?
21. Use this information: Ms. Wohlshied has to purchase paper cups and containers of water for the track-and-field competition. She knows that students often use a cup only once and then throw it away. She buys cone-shaped cups because they are nice for holding, don't hold very much water (which she thinks is good, as students often don't finish the water in their cups), and don't cost very much. This is an illustration of the cups she buys.



- a. How many cubic centimeters of water does the cone-shaped cup hold?
- b. If Ms. Wohlshied buys water in 1-liter jugs, about how many cups can be filled from one jug of water? (1 liter = 1000 cubic centimeters)
- c. How many times greater is the volume of a cone with a radius of 6 cm and a height of 7 cm than the volume of Ms. Wohlshied's cup?
- d. How many times greater is the volume of a cone with a radius of 3 cm and a height of 14 cm than the volume of Ms. Wohlshied's cup?
- e. How many times greater is the volume of a cone with a radius of 6 cm and a height of 14 cm than the volume of Ms. Wohlshied's cup?

Data Distributions

22. Ariel has a total of 320 points on all four of his exams. If these points are shared equally among the four exams, the result is 80 points per project—Ariel's mean exam score.
 - a. What would Ariel's mean score be if he had a total of 372 points for the four exams?
 - b. Give four possible exam scores that would result in this mean score.
 - c. What is the range of the scores for these four exam scores? What does this tell you about the variability of the scores?

23. Five good friends have the following number of basketball cards:

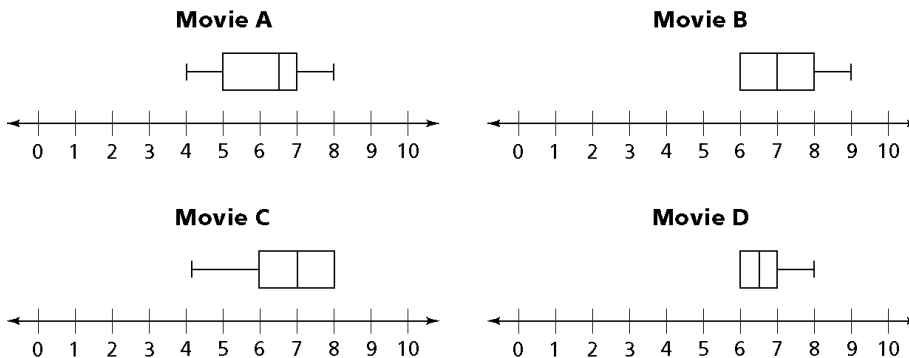
Glen	352
Benny	347
Yari	265
Jillian	261
Mark	325

- What is the range of number of cards of the five friends? What does the range tell you about the variability in the amount of cards they have?
- The five friends decided to share their cards equally. How many cards per friend will this be? Explain your reasoning.
- The five friends forgot about another friend, Susanna, when cards were shared. Susanna has 261 cards, the same amount of cards as Jillian. If Susanna's cards are included with the others' cards and shared equally among the six friends, will the first five friends now receive less, the same as, or more than they did before Susanna's cards were included? Explain your reasoning.

24. The following data are the number of hours of homework done by several students on a Monday night: 0.5, 0.5, 1, 1, 1, 1, 2, 3. If you replaced data from a student who did 0.5 hour of homework with one who did 2 hours of homework:

- Does the mean change? If so, how does it change and why?
- Does the median change? If so, how does it change and why?
- Does the range change? If so, how does it change and why?

These box plots represent the distribution of the ratings given to four movies by 20 newspapers and magazines. Compare the box plots. Which movie do you believe is the most highly recommended? Explain your reasoning.



- a. A class of tenth-grade students counted the change in coins that they had in their pockets, backpacks, or purses. Below are their results. Make a box plot of these data.

\$1.35 \$0.42 \$0.85 \$0.35 \$0.75 \$0.90 \$1.02 \$3.64 \$0.20 \$0.35 \$0.45
 \$0.75 \$0.12 \$0.10 \$0.80 \$1.75 \$1.12 \$0.41 \$0.28 \$0.25 \$0.25 \$0.40

- b. Describe what your box plot tells you about the typical amount of change carried by a student in this class.

Moving Straight Ahead

- 25a. This table shows two points that are on the same straight line. Complete the table to show three other points on the same line.

<i>x</i>	-3				1
<i>y</i>	-2				6

- b. Find the slope and the *y*-intercept of this line that represents the data.

26. Given one of the representations below, find the other two.

Table	<table border="1"> <thead> <tr> <th><i>x</i></th> <th><i>y</i></th> </tr> </thead> <tbody> <tr> <td>-2</td> <td>14</td> </tr> <tr> <td>0</td> <td>8</td> </tr> <tr> <td>1</td> <td>5</td> </tr> <tr> <td>2</td> <td>2</td> </tr> <tr> <td>3</td> <td>-1</td> </tr> </tbody> </table>	<i>x</i>	<i>y</i>	-2	14	0	8	1	5	2	2	3	-1		
<i>x</i>	<i>y</i>														
-2	14														
0	8														
1	5														
2	2														
3	-1														
Graph															
Equation			$y = \frac{1}{3}x + 1$												

- a. Find the *y*-intercept for each representation above.

b. Find the slope for each representation above.

27. The formula relating n (the number of cricket chirps per minute) to t (the temperature in degrees Fahrenheit) is $n = 4t - 160$.

a. Using a symbolic method, find how many times a cricket would chirp in a minute at 90° F.

b. It is evening, and a cricket is chirping 48 times per minute. Use a symbolic method to find the temperature.