

# SUMMER PACKET

FOR STUDENTS GOING INTO:  
**INTEGRATED MATH TOPICS 2**  
(REVIEWS CONCEPTS TAUGHT IN IMT1)

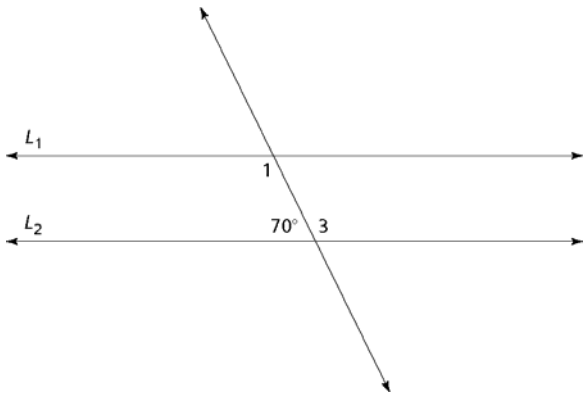


NAME: \_\_\_\_\_

DO YOUR WORK ON A SEPARATE PIECE OF PAPER, ATTACH TO THIS  
PACKET, AND SUBMIT IT TO YOUR INTEGRATED MATH TOPICS 2  
TEACHER DURING THE 1<sup>ST</sup> WEEK OF SCHOOL

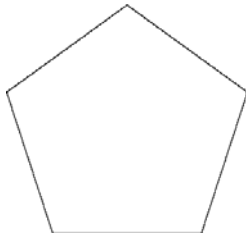
## Shapes and Designs

1. In the diagram, line  $L_1$  is parallel to line  $L_2$ .

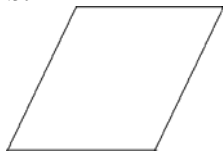


- a. What is the measure of  $\angle 3$ ? Explain how you found your answer.
- b. What is the measure of  $\angle 1$ ? Explain how you found your answer.
2. For parts (a)–(b), show all the line symmetries and give the degree measures for all the turn symmetries for the given shape.

**a.**

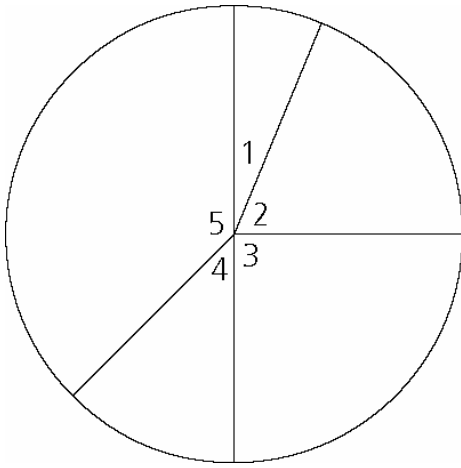


**b.**



3. A square has a perimeter of 16.4 centimeters. What is the length of each side? Explain.

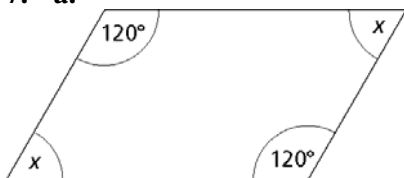
4. Use the diagram below and what you know about angle relationships to answer the following questions.



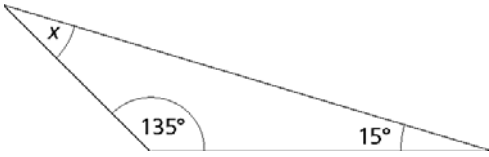
- What is the measure of angle 3?
  - The measure of angle 1 is one-fourth of the measure of angle 3.
  - What is the measure of angle 2?
  - The measure of angle 4 is twice the measure of angle 1. What is the measure of angle 4?
  - What is the measure of angle 5?
5. Can a parallelogram have two  $45^\circ$  angles and two  $75^\circ$  angles? Why or why not?

6. For each of the shapes below, find the unknown angle measure without using your angle ruler.

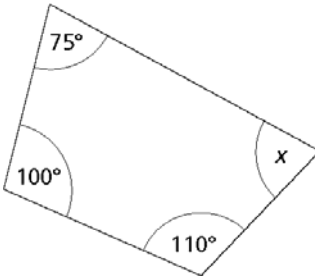
7. a.



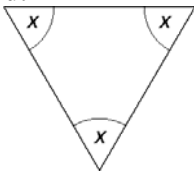
b.



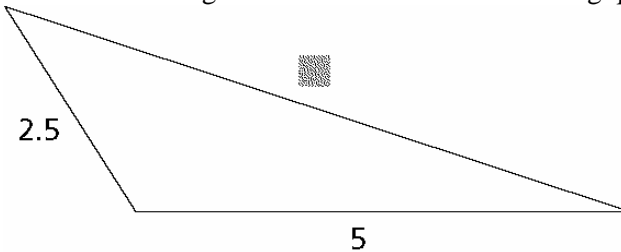
c.



d.



8. Use the triangle below to answer the following questions.



- Alex estimates that the unknown side length is about 4.5. How do you think Alex's estimate compares with the actual length? Explain your reasoning.
- Jennifer estimates that the unknown side length is about 8. How do you think Jennifer's estimate compares with the actual length? Explain.
- Use what you have learned about making triangles with polystrips to estimate the length of the unknown side. Explain why you think your estimate is close to the actual length.

## Bits II

9. For parts (a)–(b), tell which sum or difference is larger. Show your work.

a.  $\frac{4}{5} + \frac{5}{8}$  or  $\frac{4}{7} + \frac{5}{9}$

b.  $\frac{14}{12} - \frac{2}{8}$  or  $\frac{10}{9} - \frac{2}{6}$

10. Gregorio made money over his summer vacation by mowing lawns. One week he worked the following schedule:

Monday	$5\frac{1}{2}$ hours
Wednesday	$4\frac{1}{4}$ hours
Thursday	$2\frac{3}{4}$ hours
Friday	$2\frac{3}{4}$ hours

- How many hours did Gregorio work for the week?
- He needs to work 20 hours to earn the money for a trip. Will he have enough after working just this one week? Explain your thinking.

11. Which sums are greater than  $\frac{2}{3}$ ?

a.  $\frac{1}{8} + \frac{1}{6}$

b.  $\frac{2}{12} + \frac{3}{9}$

c.  $\frac{2}{6} + \frac{2}{18}$

d.  $\frac{3}{6} + \frac{1}{4}$

12. Jin-Lee and Sarah decide to make a pancake breakfast for six people. They found a recipe that will make 12 silver-dollar pancakes per batch. They need 30 silver-dollar pancakes to give 5 per person. How much of each ingredient will they need to make 30 silver-dollar pancakes?

Silver-Dollar Pancakes Recipe for 12 pancakes

$1 \frac{1}{4}$  cups flour

$\frac{1}{2}$  teaspoon salt

$1 \frac{1}{4}$  cups flour

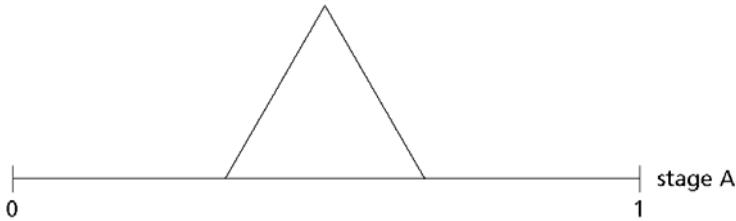
$\frac{3}{4}$  cup milk

3 teaspoons baking powder

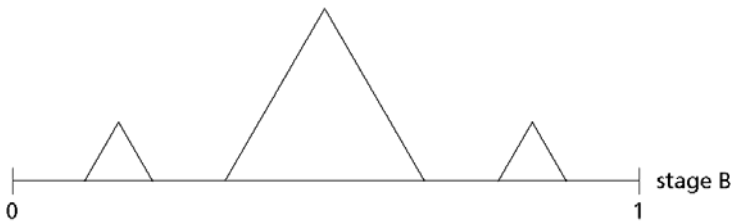
2 tablespoons salad oil

$1 \frac{1}{2}$  tablespoons sugar

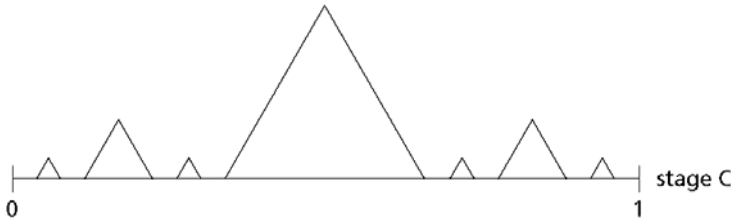
13. In stage A the middle one-third of a line segment is covered by a triangle. What fraction of the line is covered at stage A? What fraction is *not* covered?



- b.** In stage B, the middle one-third of each of the two parts that were uncovered in stage A are covered. What fraction of the line is covered at stage B? What fraction is *not* covered?



- c.** In stage C, the middle one-third of each of the parts that were not covered in stage B are covered. What fraction of the line is covered at stage C? What fraction is *not* covered?



14. Students gave four answers to this exercise:

Write two fractions with a sum greater than  $\frac{3}{4}$  but less than 1.

Which of the following answers is correct?

A.  $\frac{1}{8} + \frac{2}{4}$

B.  $\frac{1}{3} + \frac{2}{4}$

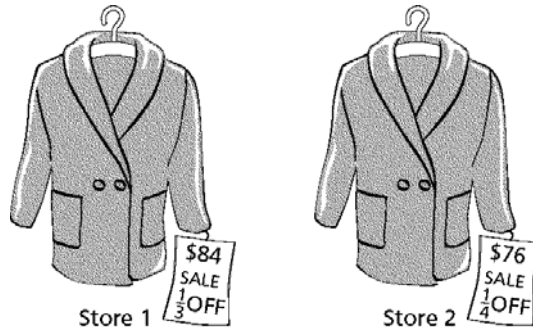
C.  $\frac{3}{6} + \frac{2}{4}$

D.  $\frac{1}{3} + \frac{1}{4}$

### Bits III

15. Elizabeth is shopping for a new winter coat. She finds the coat she likes best in two different stores.

- In the first store, the coat is priced at \$84, but a sale sign states that the coat is  $\frac{1}{3}$  off.
- In the second store, the coat is priced at \$76, but a sale sign states that the coat is  $\frac{1}{4}$  off.



- From which store should Elizabeth buy the coat if she wants to spend the least amount of money?
- Elizabeth's mother finds the same coat in a catalog. The coat is priced the same as the regular price at the store from which Elizabeth has decided to buy [based on results to part (a)], but the catalog has the coat on sale for 30% off. In addition, Elizabeth's mother has a coupon for \$5.00 off any purchase from the catalog. Any catalog order has a shipping charge of 6% of the price of an item. Which is the better buy, the coat at the store or the coat in the catalog?

16. The cost of renting a drum set is a \$25 initial fee, plus \$39.95 a month. How much will it cost to rent a drum set for a year?

17. Each solution is missing a decimal point. Correctly place the decimal into the solution. Explain how you decided where to place the decimal.

a.  $103.67 + 225.019 = 328689$

b.  $0.765 - 0.572 = 193$

c.  $3.84 \times 9.8 = 37632$

d.  $28.42 \div 8.9 = 32$

18. Use the decimal form of each fraction to find the solution. Show your work.

a.  $\frac{5}{8} + 1\frac{1}{2}$

b.  $2\frac{3}{4} - 1\frac{2}{16}$

c.  $4\frac{1}{8} \times 2\frac{1}{2}$

d.  $3\frac{3}{4} \div 1\frac{1}{4}$

19. An airplane flew at an average speed of 432 miles per hour for 2.5 hours. How far did the plane fly?

20. Mr. Cisneros is cooking for an apple celebration. He uses 10.375 pounds of apples to bake pies and 5.25 pounds of apples to make applesauce. How many more pounds of apples does he use for pies than for applesauce?

21. There are 30 students in Ms. Keusch's homeroom. Of the students, 40% are boys. How many boys are in her homeroom?

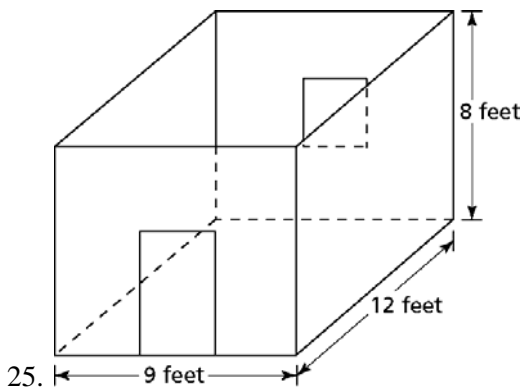
22. Troy is going to basketball camp. Before he goes, he needs to buy some things. He and his parents agree that he can buy two pairs of shorts, four t-shirts, six pairs of socks, and a jacket. Shop Easy has everything they need for the following prices:

Shorts	\$7.98 each
T-shirts	\$6.35-on sale: buy one at the regular price, and get a second at half price
Socks	\$1.98 for two pairs
Jackets	\$19.99 each

- a. How much will the total bill for Troy's clothes be, including sales tax of 8%?
- b. Troy had \$100 when he started his shopping. Did he have enough money? If so, how much extra? If not, how much was he short?
23. In the refrigerator, Teguh found 75% of a pizza. He ate 50% of what was left. How much pizza did he eat?

### ***Covering and Surrounding***

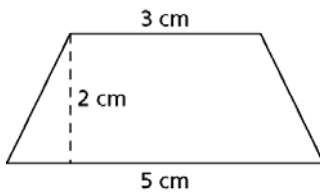
24. Jason is planning to redecorate his bedroom. He measured the room and made this rough sketch.



- a. Jason is planning to buy paint for the walls and ceiling. Will he need to find the perimeter or area to figure out how much paint to buy? What unit of measure should he use?
- b. To determine how much new carpet to buy, will Jason need to find the perimeter or area? What unit of measure should he use?

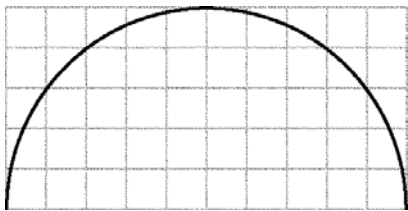
- c. Jason also needs baseboard for around the bottom of the walls. Will he need to find the perimeter or area to figure out how much baseboard to buy? What unit of measure should he use?
- d. How much carpeting does Jason need? Show how you found your answer.
- e. How much baseboard does Jason need? Show how you found your answer.
- f. If a gallon of paint covers 350 square feet, how much paint does Jason need for the walls and ceiling?

26. Chad's dad wants to repaint the top of the step outside the front door with special paint that doesn't get slippery in the rain. Below is the drawing of the top of the step. Each centimeter represents 1 foot.



- a. Using the scale drawing, help Chad's dad by finding the area of the step. Keep a record of your work and sketches so you can convince him that you found it correctly.
- b. Each quart of paint covers 32 square feet. Chad's dad wants to apply two coats of paint. How many quarts of paint should he buy? Explain your answer.

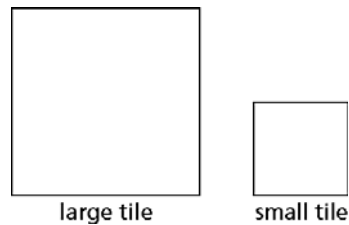
27. Lydia's stepmother decided to paint the semicircular patio in their back yard. Here is Lydia's sketch of the patio, drawn on a grid. Each grid square represents 1 square foot.



- a. What is the area of the patio? Explain how you found the area.

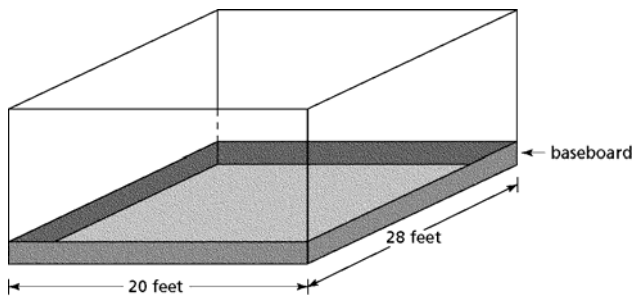
- b. Each quart of nonslip paint covers 32 square feet. How much paint should Lydia's stepmother buy if she plans to put one coat of paint on the patio? Keep a record of your work.
- c. To keep grass from growing onto the patio, Lydia wants to plant a border around the patio. Since the patio is against the house, she only needs a border around the curved edge. How long will the border be? Show how you found your answer.

28. Shown below are the relative sizes of a large tile and a small tile. When measured with large tiles, the area of a rectangular room is 12 square units and the perimeter is 16 units.



- a. What would the area and perimeter of the room be (in tile units) if it were measured with the small tiles?
- b. How do the measures you found in part (a) compare to the measures found by using the large tiles?

29. Lara is helping her family build a recreation room in their basement. The room will be 28 feet by 20 feet. They have already put up the walls.



- a. The family wants to tile the floor. Lara decides to buy 1-foot-square tiles. How many tiles will she need? Show your work.
- b. The tiles Lara has chosen cost \$.75 each. How much will the tile floor cost? Show how you found your answer.

- c. Lara needs to buy baseboard to put along the wall. How much baseboard does she need? Show how you found your answer.
- d. The baseboard comes in 10-foot and 16-foot lengths. How many boards of each length should Lara buy? Show how you found your answer.

30. When you encounter problems like this in the real world, you will often have to consider several factors. Suppose these are the prices of the baseboard.

Baseboard	
16-ft lengths	\$1.25 per foot
10-ft lengths	\$1.10 per foot

How many boards of each length should Lara buy if she wants to spend the least amount of money? Explain your answer.

- a. When two sections of baseboard meet, they create a *seam*.



If Lara wants as few seams as possible, how many baseboards of each length should she buy?

- b. If you were Lara, how many baseboards of each length would you buy?

### ***What Do You Expect***

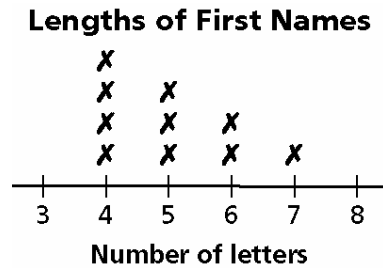
31. A bag contains two green marbles, four yellow marbles, six blue marbles, and eight red marbles. Draws of marbles are made randomly.

- a. What is the probability of drawing a blue marble?
- b. What is the probability of not drawing a blue marble?
- c. If you double the number of green, yellow, blue, and red marbles in the bag, what will be the probability of drawing a blue marble?
- d. How does your answer to part (c) compare with your answer to part (a)? Explain
- e. If you add two of each color to the original bag of marbles, what will be the probability of drawing a blue marble?
- f. How does your answer to part (e) compare with your answer to part (a)? Explain.

- g. How many blue marbles would you need to add to the original bag of marbles to make the probability of drawing a blue marble  $\frac{1}{2}$ ?
32. A bag contains two red marbles and two white marbles.
- After a marble is drawn, it is replaced before the next draw. What is the probability that a red marble will be drawn twice in a row? Explain.
  - If a marble is drawn and is not replaced before the second marble is drawn, what is the probability that two red marbles will be drawn? Explain.
33. Brianna and Emmanuel are given another chance to win prizes on the Gee Whiz Everyone Wins! game show. Brianna arranges three red marbles and three green marbles in two containers while Emmanuel is out of the room. Emmanuel will choose a container and draw out one marble. If he draws a red marble, the friends each win a prize. What arrangement of marbles in the container will give the friends the best chance of winning?

### ***Data About Us***

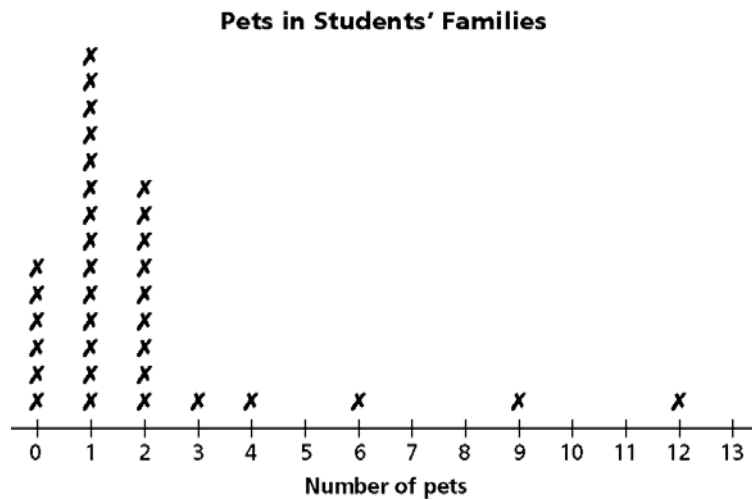
34. For the distribution below, tell how many people are represented and identify the mode, median, and range.



35. Make a line plot showing the ages in years of 12 students so that the median age is 12.5 years and the difference between the highest age and the lowest age is 9 years.
36. The mean number of children in six families is 5 children.
- What is the total number of children in the six families?
  - Other than six families of 5 children, create a set of families that fits this information.

- c. Would another classmate's set of families for question (b) have to be the same as yours? Explain.

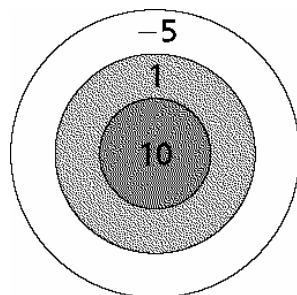
37. A class investigated how many pets each student in the class had. A number of students in their class had no pets at all. Here's how their data looked:



- a. Would it be possible to have a data set for which the median number of pets for students is 0? Explain.
- b. Would it be possible to have a data set for which the mean number of pets for students is 0? Explain

### ***Accentuate the Negative***

38. Terri made up a game of darts for a party. To play the game, you throw three darts at the board and then total your points. The highest score wins. Everyone at the party played the game several times. List all possible scores for three darts if all three hit the target.



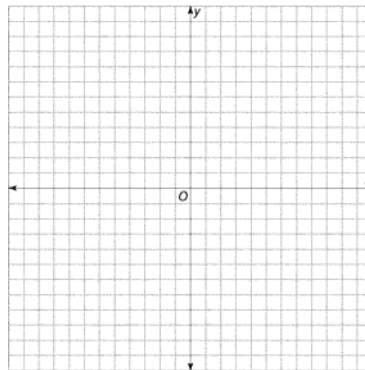
39. One integer added to another integer gives a sum of  $-9$ . When the smaller integer is subtracted from the greater integer, the difference is 1. What could the two integers be?

40. Below is a grid with four quadrants. On your graph paper, plot the following points, and connect them with line segments

Point  $A$  (1, 0)

Point  $B$  (3, 4)

Point  $C$  (4, 0)



- On the same grid paper, transform your figure  $ABC$  using the rule  $(2x, 2y)$ .
- On the same grid paper, transform your figure  $ABC$  using the rule  $(-2x, -2y)$ .
- On the same grid paper, transform your figure  $ABC$  using the rule  $(-2x, 2y)$ .
- On the same grid paper, transform your figure  $ABC$  using the rule  $(2x, -2y)$ .
- Without drawing, predict what will happen to  $ABC$  using the rule  $(3x, 3y)$ .
- Without drawing, predict what will happen to  $ABC$  using the rule  $(-3x, -3y)$ .
- Without drawing, predict what will happen to  $ABC$  using the rule  $(-3x, 3y)$ .

42. Suppose the temperature is  $6^\circ$ . What will the temperature be if it rises  $22^\circ$ ?

43. Suppose the temperature is  $6^\circ$ . What will the temperature be if it falls  $7^\circ$ ?

44. Barry plays fullback on his high school football team. Sometimes he gains yardage (+5 means a 5-yard gain). Sometimes he loses yardage (-3 means a 3-yard loss). Determine Barry's total yardage in each game below.

a. Game 1:            +4      +6      +7      +1      -8

b. Game 2:            +6      -3      0      +15      -1      +8      +11      -6

45. Suppose the Rocky Mountains have 72 centimeters of snow. Warmer weather is melting the snow at a rate of 5.8 centimeters a day. If the snow continues to melt at this rate, after seven days of warm weather, how much snow will be left?

46.  $-14 - +8 =$

47.  $18 - 27 =$

48.  $14 - -8 =$

49.  $-150 - +24 =$

50.  $90 - -99 =$

51.  $\underline{\hspace{1cm}} + 21 = 13$

52. Use this information: Suppose you are in a building in which the floors are numbered from 0 to 15. The building has an underground parking garage with 10 levels, which are numbered from -1 to -10. Which floor is *farther from* floor -2? (Drawing a picture may help you solve this problem.)

a. floor 7 or floor -10

b. floor 2 or floor -8

c. floor 1 or floor -5

53. Find the answers of the following number sentences.

a.  $(5 + -3) \times 4 - 2$

b.  $3^2 \times -7 + 2$

c.  $4 - 4 \times 2 + 2 \times -1$

d.  $2 \times (3 + -10) - 2^2$

e.  $10 - (50 \div (-2 \times 25) + 7) \times 2^2$

54. Use the distributive property to write an expression equal to each of the following. Solve for parts (a) and (b) and simplify the expression in part (c).

a.  $-2 \cdot (-8 + 5)$

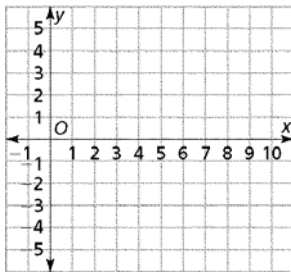
b.  $(-7 \cdot -2) - (-7 \cdot -12)$

c.  $x \cdot (9 + -5)$

55. In the school's Future Investors Club stock market game, the following gains/losses in stock price were earned over 10 days.

Day	1	2	3	4	5	6	7	8	9	10
Gain/Loss	-\$5.50	\$0	-\$3.50	\$3	\$4	-\$0.50	\$1	-\$2	-\$2.4	-\$3

Companies often plot stock price gains/losses to display the changes over time. Plot a graph of the (day, gain/loss) data for the Future Investors Club.



56. Use the distributive property to write each of these calculations in an equivalent form.

a.  $(56 \times 115) + (56 \times -15)$

b.  $10 \times (-6 - 3)$