Name:

Grade 7 Mathematics
Summer Packet

Please take your time in completing this packet, as it is not designed to be completed in a weekend or an evening!
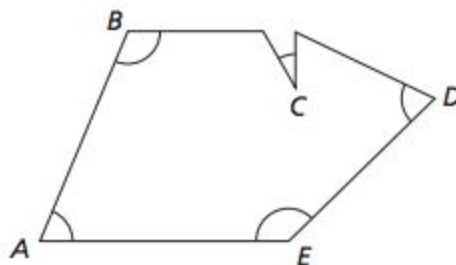
Stay sharp & have a wonderful summer!

Table of Contents

Shapes & Designs Review

Use the diagram of the polygon shown below to answer the following questions.

a. Estimate the measures of each angle.

Angle A: Angle B:
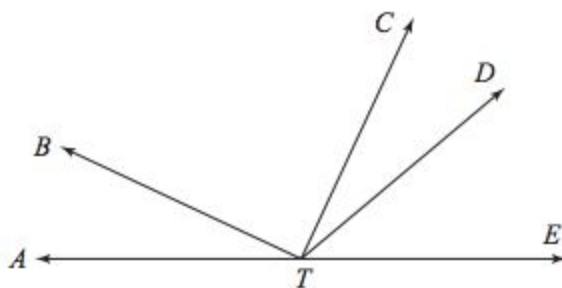
Angle C   Angle D:

Angle E:

b. Measure each angle. How do the measures compare with your estimates from part (a)?

Find each of the angle measures below using an angle ruler or protractor.

a. $m\angle BTA$ **b.** $m\angle CTB$

c. $m\angle ETB$ **d.** $m\angle DTB$

e. the complement of $m\angle ETC$ **f.** the supplement of $m\angle BTA$

An isosceles triangle has two 50° angles. What is the measure of the third angle? Explain how you found your answer.

One angle of an isosceles triangle measures 100°. What are the measures of the other two angles? Explain your reasoning.

Two of the angles of a parallelogram each measure 75°. What are the measures of the other two angles? Explain your reasoning.

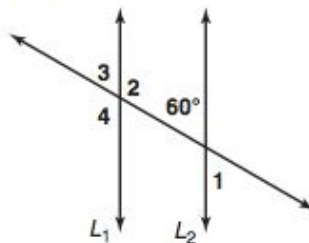One angle of a parallelogram measures 40° and another angle measures 140°. What are the measures of the other two angles? Explain how you found your answer.

In each diagram below, lines L_1 and L_2 are parallel lines cut by a transversal. Find the measure of each numbered angle.
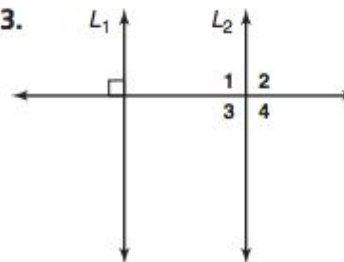
1.
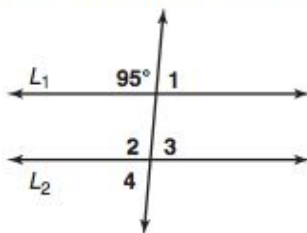
2.

3.

Accentuate the Negative Review

Find each difference.

1. $9 - 26$

2. $-4 - 15$

3. $21 - (-7)$

4. $27 - (-16)$

5. $-16 - (-43)$

6. $47 - 19$

7. $-156 - 98$

8. $-192 - 47$

9. $0 - (-51)$

10. $-63 - 89$

11. $-12 - (-21)$

12. $92 - (-16)$

13. $72 - 15$

14. $-86 - (-19)$

15. $17 - (-46)$

Find each sum or difference as a mixed number or fraction in simplest form.

1. $\frac{3}{4} + \frac{7}{8}$

2. $-1\frac{1}{6} + 2\frac{2}{3}$

3. $4\frac{1}{2} - 7\frac{7}{8}$

4. $-3\frac{5}{6} - \left(-4\frac{1}{12}\right)$

5. $\frac{5}{18} + \frac{7}{12}$

6. $-4\frac{7}{20} + 3\frac{9}{10}$

7. $5\frac{8}{21} - \left(-3\frac{1}{7}\right)$

8. $1\frac{19}{24} + 2\frac{23}{20}$

9. $3\frac{16}{25} - 4\frac{7}{20}$

10. $14.6 + \left(-3\frac{1}{5}\right)$

Each expression is in factored form. Use the Distributive Property to write the expression in expanded form.

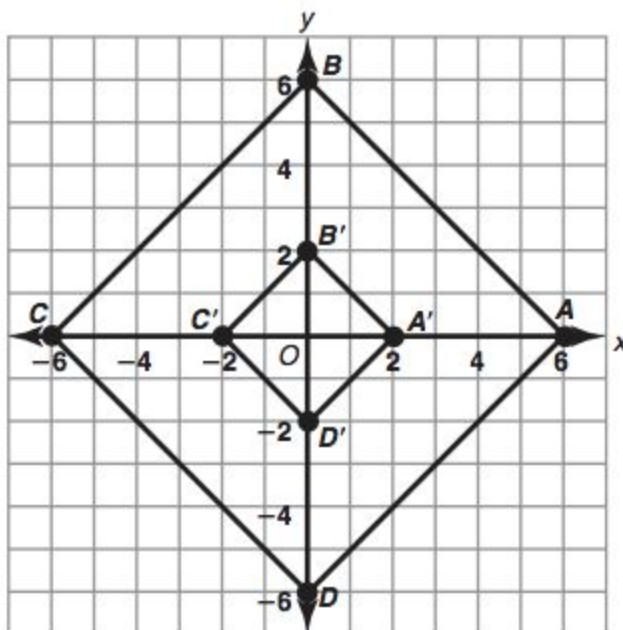11. $6(h - 4)$

12. $(p + 3)5$
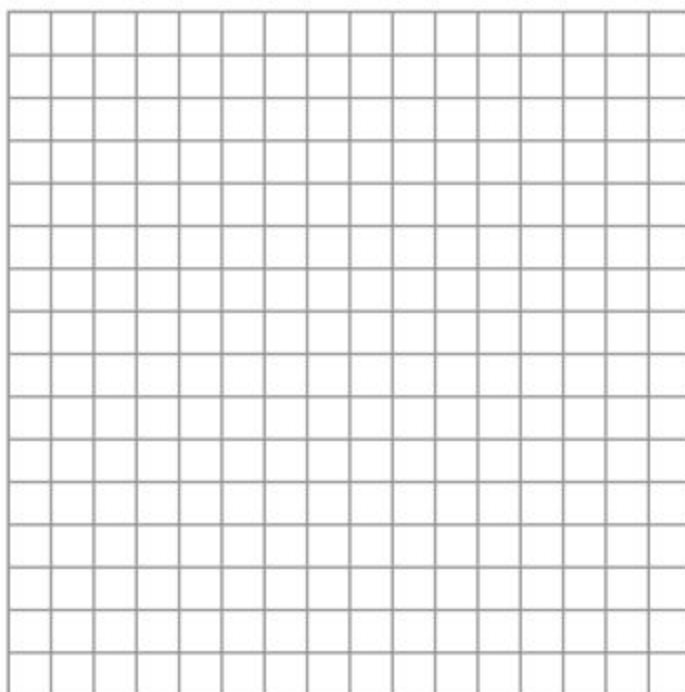
13. $-3(x + 8)$

14. $(4 - y)(-9)$

15. $2(7n - 11)$

16. $-10(-a + 5)$

Stretching & Shrinking Review

Quadrilateral $A'B'C'D'$ is similar to quadrilateral $ABCD$. Find the scale fact from $ABCD$ to $A'B'C'D'$.

On the grid below, make a right triangle with legs of length 8 and 12.

a. Give the leg lengths of two smaller right triangles that are similar to the one you drew and that have whole-number side lengths.

b. Copies of each smaller triangle can be put together to exactly match the original triangle. How many of each smaller triangle does it take to match the original?
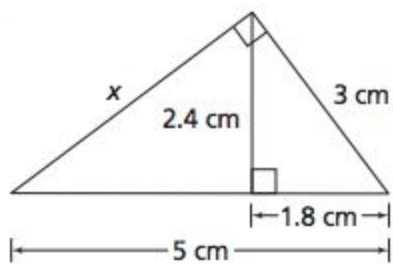
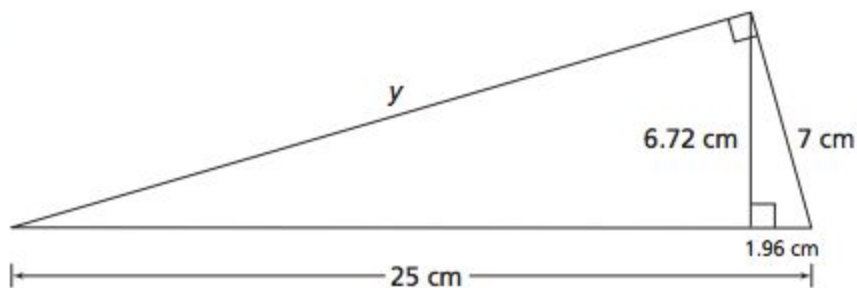Find the missing side lengths in each pair of similar figures below.

a.

3 cm

x

2 cm

8 cm

. In each figure below, find the missing measurement.

a.

b.

Comparing & Scaling Review

This table shows the typical weight of various parts of the body for an adult weighing 152 pounds. Estimate the percent of the total body weight for each part. Explain your reasoning.

Body Part	Weight (lb)
Head	10.5
Neck and Trunk	70.0
Arms	16.5
Hands	2.5
Legs	47.5
Feet	5.0

.

a. Of the 756 students in Chad's middle school, 44% participate in sports, 29% play in the band, and 37% take the bus to school. How many students in Chad's middle school play in the band? Explain your reasoning.

b. How many students in Chad's middle school take the bus to school?

c. If you add up the percents of students who play sports, play in the band, and take the bus to school, you get 110%. Explain why the percents do not add to 100%.

Gabrielle, Hannah, and Gavin decide to share 12 cookies between them, so each of them gets 4. When another friend Blake joins them, they decide to share the 12 cookies, so that each person gets 3.

a. Use a ratio to compare numbers of people before and after Blake arrives.

b. Use a ratio to compare the number of cookies in each share before and after Blake arrives.

c. What do you notice about the ratios? Will this always be true?

A contractor estimates it will cost $2,400 to build a deck to a customer's specifications. How much would it cost to build five more identical decks?

A recipe requires 3 cups of flour to make 27 dinner rolls. How much flour is needed to make 9 rolls?

Mandy runs 4 kilometers in 18 minutes. She plans to run in a 15-kilometer race. How long will it take her to complete the race if she runs at the same pace?

Ken's new car can go 26 miles per gallon of gasoline. The car's gasoline tank holds 14 gallons. How far will he be able to go on a full tank?

For Exercises 11–14, find each unit price. Then determine the better buy.

11. crackers: 15 ounces for $1.79
          12 ounces for $1.49

12. apples: 3 pounds for $1.89
          5 pounds for $2.49

13. mechanical pencils: 4 for $1.25
          25 for $5.69

14. bagels: 4 for $0.89
          6 for $1.39

Determine if each table represents a proportional relationship. Explain how you know.

7.

°F	32	77	122	167	212
°C	0	25	50	75	100

8.

Miles	0.25	0.5	1.0	2.0	4.0
Dollars	5	6	8	12	20

9.

Pages	1	2	3	10	20
Dollars	0.25	0.50	0.75	2.50	5.00

10.

Words	250	500	750	1,000	1,500
Minutes	5	10	15	20	30

Moving Straight Ahead Review

1. You order books through a catalog. Each book costs $12 and the shipping and handling cost is $5. Write an equation and make a graph that represents your total cost.

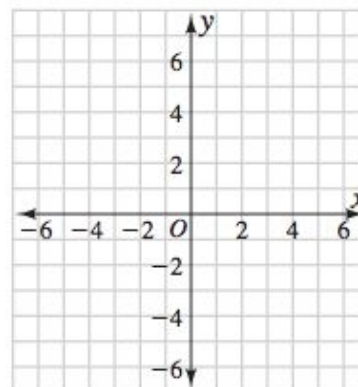   a. What is the total cost if you buy 6 books?
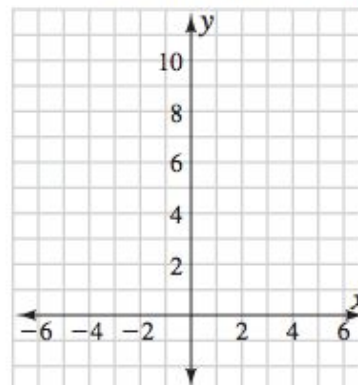
   b. What is the total cost if you buy 4 books?

2. A ride in a taxicab costs $2.50 for the first mile and $1.50 for each additional mile or part of a mile. Write an equation and make a graph that represents the total cost.
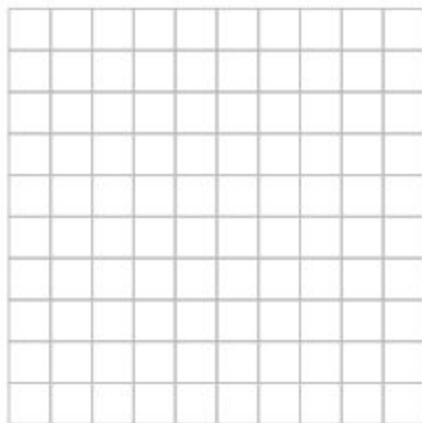

   a. What is the total cost of a 10-mile ride?

   b. What is the total cost of a 25-mile ride?

For Exercise 3, refer to this table.

Cycling time (hours)	Distance (miles)		
	Francine	Geraldo	Jennifer
0	0	0	0
1	4.5	6	7.5
2	9	12	15
3	13.5	18	22.5
4	18	24	30

3. a. Graph the time and distance for all three people on the same coordinate axes.

b. Use the graphs to find the distance each person traveled in 2.5 hours.

c. Use the graphs to find the time it took each person to travel 70 miles.

d. How does the rate at which each person rides affect the graphs?

The volleyball team decided to raise money for an end-of-season party by selling school buttons. The costs and the revenue of selling the buttons are shown on the graph below.

Button Sales
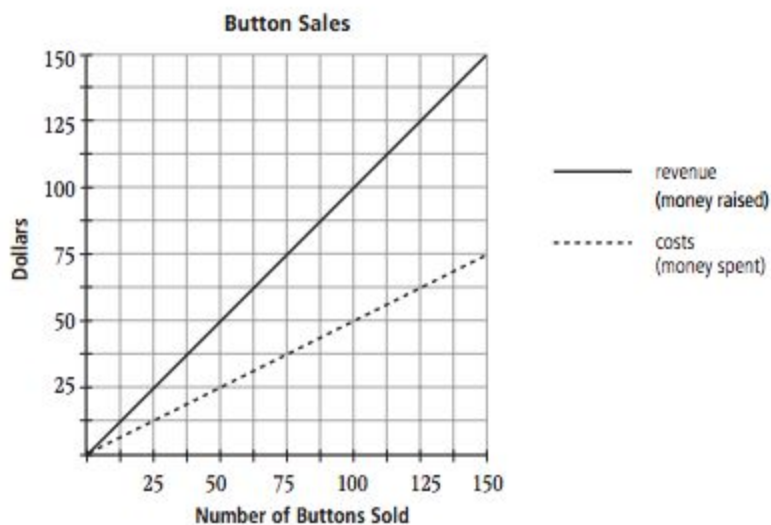
a. If the team sells 50 buttons, what will be their cost? What will be the revenue?

b. If the team sells 50 buttons, how much profit will they make? (Remember that the profit is the revenue minus the cost.)

c. If the team sells 100 buttons, how much profit will they make?

Tomatoes are $0.80 per pound at Rob's Market, and $1.20 per pound at Sal's Produce. You have a coupon for $1.40 off at Sal's. (Assume that you buy at least $1.40 worth of tomatoes.)

a. Write an equation relating the cost y to the number of pounds x at each market.

Rob's: Sal's:

b. Use a graph to estimate the number of pounds for which the cost is the same at either store.
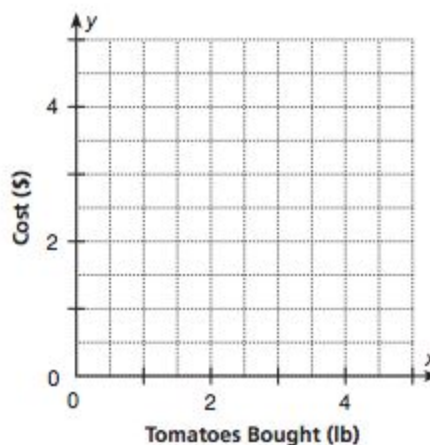
1. Determine whether each point is a solution of $y = 3x - 8$.

    a. $(0, -8)$ **b.** $(6, -10)$ **c.** $(-2, -2)$ **d.** $(4, 4)$

2. Determine whether each point is a solution of $y = -5x + 19$.

    a. $(-3, 4)$ **b.** $(0, 19)$ **c.** $(2, 9)$ **d.** $(-4, 39)$

Use the equation $y = -2x + 1$. Complete each solution.

3. $(0, \Box)$ **4.** $(-5, \Box)$ **5.** $(20, \Box)$ **6.** $(-68, \Box)$

Will these lines intersect? Explain.

1. $y = 6x + 12$

$y = 2x - 4$
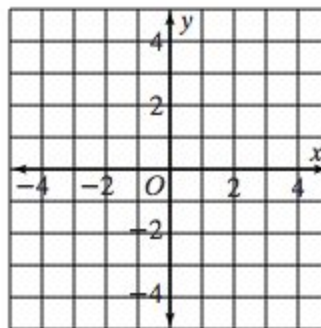
2. $y = -3x$

$y = \frac{1}{4}x - \frac{1}{8}$

3. $y = -\frac{1}{2}x + 1$

$y = -\frac{2}{5}x + \frac{2}{5}$

4. Find the point of intersection of the two lines by graphing.

$y = -x + 3$

$y = x + 1$

Solve each equation. Check your answers.
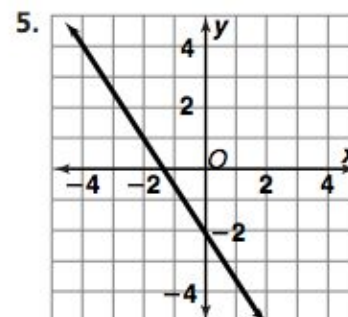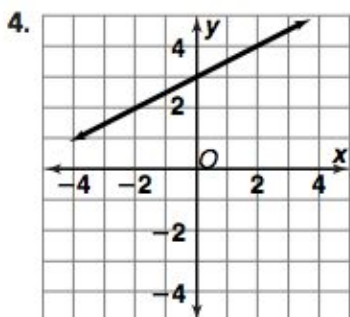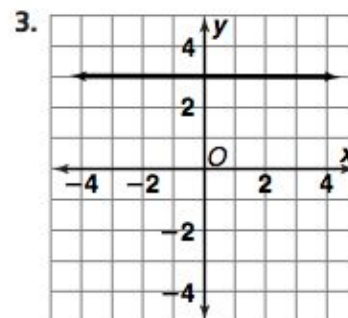
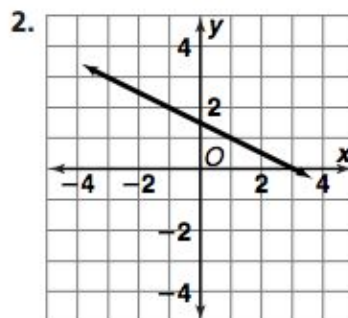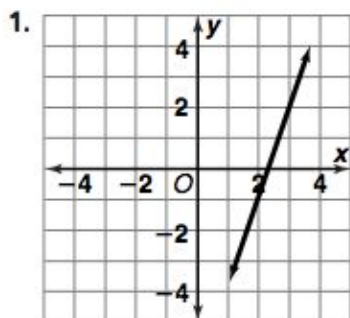**1.** $10 + 5h = 25$

2. $8s - 8 = 64$
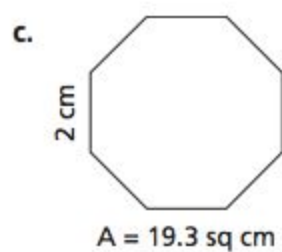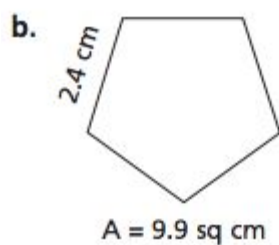
3. $3y + 78 = 81$

4. $2g + 4 = 12$

5. $5j + 5 = 15$

6. $3w + 8 = 20$

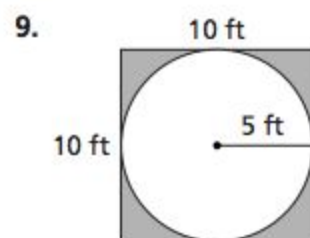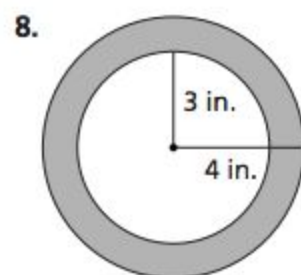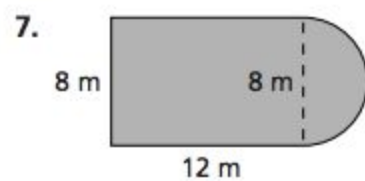**Find the slope of each line.**

1.

2.

3.

4.

5.

Filling & Wrapping Review (Geometry)

Each polygon below is the base of a regular prism whose height is 8 centimeters. Find the surface area and volume of each prism. Round to the nearest 0.1 if needed.
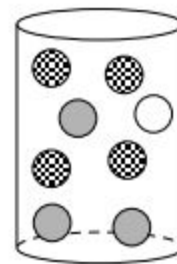
a.

5 cm

b.

2.4 cm

A = 9.9 sq cm

c.

2 cm

A = 19.3 sq cm
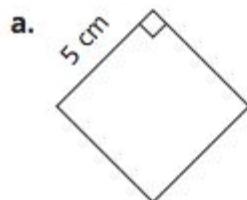
Find the area of each shaded region to the nearest tenth.

7.

8 m

8 m

12 m

8.

3 in.

4 in.

9.

10 ft

5 ft

10 ft

What Do You Expect? Review (Probability)

A can contains 8 chips. Three chips are gray, 4 are checkered, and 1 is white.

a. What is the probability of drawing a white chip?

b. What is the probability of drawing a checkered chip?

c. What is the probability of drawing a gray chip?

d. What is the probability of *not* drawing a white chip?

e. What is the probability of *not* drawing a gray chip?

5. A bucket contains 24 blocks. Some are blue, some are green, some are red, and some are yellow. The theoretical probabilities of drawing a blue, green, or red block are:

$$P(\text{blue}) = \tfrac{1}{12}, P(\text{green}) = \tfrac{1}{8}, P(\text{red}) = \tfrac{1}{3}.$$

   a. How many blue blocks are in the bucket?

   b. How many green blocks are in the bucket?

   c. How many red blocks are in the bucket?

   d. How many yellow blocks are in the bucket?

   e. What is the probability of drawing a yellow block?

   f. What is the probability of *not* drawing a yellow block?

6. If you roll two number cubes and add the results, which is more likely, getting an even sum or getting an odd sum? Explain.

7. If you roll one number cube and add the numbers on the top and bottom faces, which is more likely, getting an even sum or getting an odd sum? Explain.