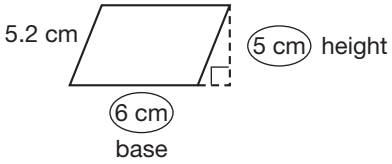
Name _____

• Area of a Parallelogram
• Angles of a Parallelogram

- Area of a parallelogram = *base* × *height*

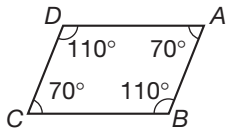
$$A = bh$$

The height is perpendicular to the base.



$A = bh$
$= (6 \text{ cm})(5 \text{ cm})$
$= 30 \text{ cm}^2$

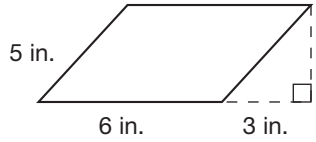
- Adjacent angles (angles that share a common side) are supplementary—that is, their sum is 180°.
- Non-adjacent angles (angles across the parallelogram from each other) have equal measures.



Practice:

Find the area of each parallelogram.

1.



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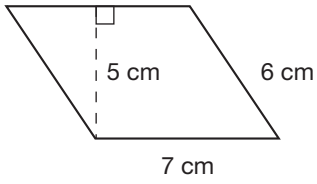
2.



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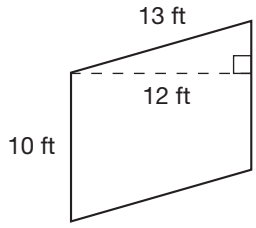
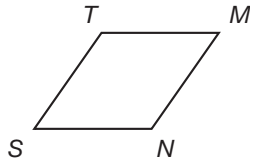
3.



_____

4. In parallelogram *MNST*, m∠*S* is 55°. Find each angle measure.

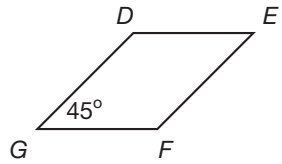


a. m∠*N* = _____

b. m∠*T* = _____

c. m∠*M* = _____

5. Figure *DEFG* is a parallelogram. Find each angle measure.



a. m∠*D* = _____

b. m∠*E* = _____

c. m∠*F* = _____

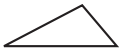
Name _____

• Classifying Triangles

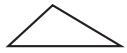
- Each angle of a triangle has a side that is *opposite* that angle.
- The *longest* side of a triangle is *opposite* the *largest* angle.
- The *shortest* side of a triangle is *opposite* the *smallest* angle.
- A regular triangle is called an **equilateral triangle.**

Classifying Triangles

By Sides

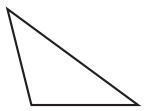
Characteristic	Type	Example
Three sides of equal length	Equilateral triangle	
Two sides of equal length	Isosceles triangle	
Three sides of unequal length	Scalene triangle	

By Angles

Characteristic	Type	Example
All acute angles	Acute triangle	
One right angle	Right triangle	
One obtuse angle	Obtuse triangle	

Practice:

Classify each triangle by its angles.

1. 

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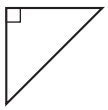
2. 

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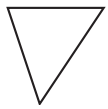
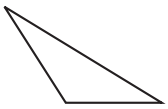
3. 

_____

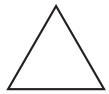
Classify each triangle by its sides.

4. 

_____

5. 

_____

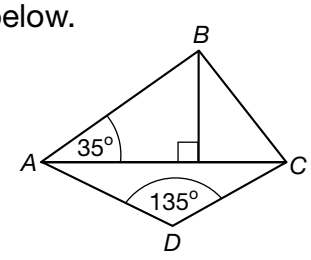
6. 

_____

7. Find an example of each triangle in the figure below.

a. an isosceles triangle _____

b. an obtuse triangle _____



• Symbols of Inclusion

- Here are some symbols of inclusion:

  (parentheses) [brackets] {braces} |absolute value|

- If there is more than one symbol in a problem, simplify within the *innermost* symbols *first.*

  Example: Simplify $50 - [20 + (10 - 5)]$.

  First simplify within the parentheses.

  $50 - [20 + (5)]$ simplified within parentheses

  $50 - [25]$ simplified within brackets

  25 subtracted

- A division bar can also be a symbol of inclusion.
  Simplify above and below the division bar *before* you divide.

  Example: Simplify $\frac{4 + 5 \times 6 - 7}{10 - (9 - 8)} = \frac{4 + 30 - 7}{10 - (1)} = \frac{27}{9} = 3$

Practice:

Simplify 1–6.

1. $4\{100 - [3^2 - 2(10 - 6)]\}$

_____

2. $100 - \{160 - 6[2 + 3(2^2)]\}$

_____

3. $75 - 7[4(3 - 1)]$

_____

4. $\frac{15 + (14 + 6)}{(7 \cdot 8) - (7)^2}$

_____

5. $\frac{(39 - 6^2 + 4)^2 - 3^2}{(-12 - |-8|)^2}$

_____

6. $\frac{(10 + 5^2) \div 7}{\sqrt{100}}$

_____

Name _____

• Adding Positive and Negative Numbers

To add signed numbers:

- If the signs are the *same, add* the absolute values and keep the same sign.

  Example: (–5) + (–4) = –9

- If the signs are *different, subtract* the absolute values and keep the sign of the number with the greater absolute value.

  Example: (–5) + (+4) = –1

- When there are many signed numbers, *rearrange* the terms and add all the numbers with the same sign first.

  Example: (–3) + (–2) + (+7) + (–4)

  (–3) + (–2) + (–4) + (+7) rearranged

  (–9) + (+7) added

  –2 added

- The sum of two opposites is zero.

  Example: (–3) + (+3) = 0

Practice:

Simplify 1–6.

1. (–28) + (+75)

_____

2. (–9) + (–12) + (+20)

_____

3. (–18) + (–12) + (–10)

_____

4. (–7) + (+7) + (–17)

_____

5. (+3) + (–10) + (+4) + (–3)

_____

6. (–8) + (–9) + (+2) + (–7)

_____

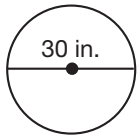
• Circumference and Pi

- To find the relationship between the circumference of a circle and π (pi):
  1. Measure the diameter and circumference of a circle.
  2. Divide the circumference by the diameter.
     The answer will always be about
     3.14159265... (≈ 3.14).
     This number is π (pi). Both 3.14 and $\frac{22}{7}$ are often used to approximate π.

Use the *radius* or *diameter* of a circle to find the circumference. Multiply the diameter by 3.14 or $\frac{22}{7}$. The formula is $\boldsymbol{C = \pi d}$.

- There are three common ways to find the circumference of a circle.

1.



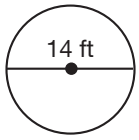
Use 3.14 for π.

$C = \pi d$

$C \approx 3.14(30 \text{ in.})$

$C \approx 94.2 \text{ in.}$

2.



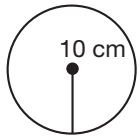
Use $\frac{22}{7}$ for π.

$C = \pi d$

$C \approx \frac{22}{7}(14 \text{ ft})$

$C \approx 44 \text{ ft}$

3.



Leave π as π.

$C = \pi d$

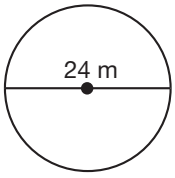
$C = \pi(20 \text{ cm})$

$C = 20\pi \text{ cm}$

Practice:

Find the circumference of each circle.

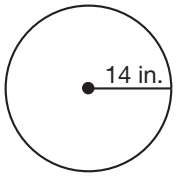
1.



Use 3.14 for π.

_____

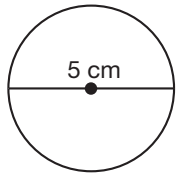
2.



Use $\frac{22}{7}$ for π.

_____

3.



Leave π as π.

_____

4. The circumference of a circle is 440 inches.
Is 90 inches a good estimate for the diameter? Why or why not?

_____

• Ratio Problems Involving Totals

Some ratio problems require using the total to solve the problem.

- Make and complete a ratio box.
  1. Use three rows including a total row.
  2. Write given numbers in boxes and write a letter for each unknown.
- Write a proportion using only two rows.
  1. Use the row that answers the question asked.
  2. Use the row that is complete with two numbers.
- Solve the proportion.
  1. Cross-multiply.
  2. Divide by known factor.

Example: The ratio of boys to girls was 5 to 4. If there were 180 students in the assembly, how many girls were there?

	Ratio	Actual Count
Boys	5	*B*
Girls	4	*G*
Total	9	180

$$\frac{\text{girls}}{\text{total}} = \frac{4}{9} = \frac{G}{180}$$

$$9 \cdot G = 180 \cdot 4$$

$$9G = 720$$

$$G = \frac{720}{9}$$

$$G = 80 \text{ girls}$$

Practice:

1. The ratio of cars to trucks crossing the bridge is 7 to 9. If a total of 640 trucks and cars crossed the bridge one morning, how many trucks crossed the bridge? _____

2. Use the ratio box to solve this problem: Seven hundred twenty people attended the fair. If the ratio of adults to children was 2 to 4, how many children attended the fair?

	Ratio	Actual Count
Adults	2	*A*
Children	4	*C*
Total	6	720

_____

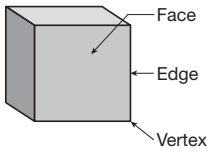
3. The ratio of chairs to tables in the restaurant was 10 to 3. If there were 130 tables and chairs altogether, how many tables did the restaurant have?

_____

• Geometric Solids

- **Polygons** are two-dimensional shapes. Polygons have no height or depth.
- **Geometric solids** are three-dimensional shapes that take up space.

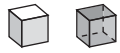
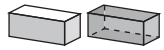
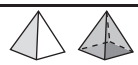
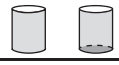
  Polyhedrons are solids that have only *flat surfaces.* Polyhedrons have *faces, edges,* and *vertices.*

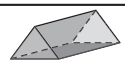


  A **prism** is a polyhedron. It has a polygon of a constant size running through it that appears on the opposite face of the prism.

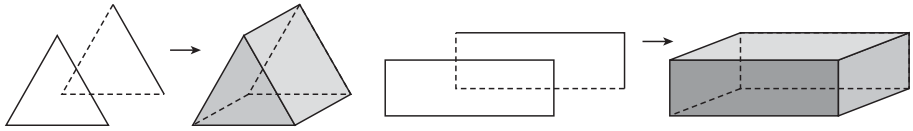
  A **cube** is a special rectangular prism. All faces of a cube are squares.

Geometric Solids

Name	Shape
Cube	
Rectangular Prism	
Pyramid	
Cylinder	
Sphere	
Cone	

Name	Shape	
Triangular Prism		Prisms
Rectangular Prism		
Cube		

- To calculate the **surface area** of a geometric solid:
  1. Find the area of each of the faces.
  2. Add these areas together.
- To *draw* a prism, draw two identical parallel polygons.
  Draw segments connecting vertices.
  Use dashes to indicate edges hidden from view.



Practice:

1. How many vertices and edges does a triangular prism have? _____

2. Which of these geometric solids is a polyhedron:

cone, cylinder, sphere, or pyramid? _____

3. A triangular cookie cutter is pressed into a flattened mound of dough. What three-dimensional shape does it create?

_____

Name _____

• Algebraic Addition

- **Opposites** are numbers that can be written with the same digits but with opposite signs.

  Examples: 3 is the opposite of −3.
  −3 is the opposite of 3.

- In **algebraic addition,** instead of subtracting a number, *add* its *opposite.* Instead of subtracting a positive, *add* a *negative*.

  Example: Simplify $7 - (+3)$.
  $7 + (-3) = 4$

  Instead of subracting a negative, *add* a *positive*.

  Example: Simplify $-3 - (-2)$.
  $-3 + (+2) = -1$

Practice:

Simplify 1–6.

1. $(-5) - (-6) + (-1)$ _____

2. $(-3.1) - (-7.5) + (+1.8)$ _____

3. $(-9) + (-2) - (-6) + (-5)$ _____

4. $(+5.2) + (-2.6) - (-3.7)$ _____

5. $(-8) - (+7) - (+10)$ _____

6. $\left(+4\frac{1}{2}\right) - \left(-3\frac{1}{4}\right) - \left(+1\frac{1}{2}\right)$ _____

• Proper Form of Scientific Notation

- The proper form of scientific notation has one digit to the left of the decimal point.

  Examples: $4600 = 4.6 \times 10^3$ $0.0046 = 4.6 \times 10^{-3}$

- To change a number to proper form follow the two steps shown in this example.

  Example: Write 4600×10^5 in scientific notation.

  1. First write 4600 in scientific notation and substitute into the original problem.
     $4600 = 4.6 \times 10^3$
     If $4600 = 4.6 \times 10^3$, then $4600 \times 10^5 = 4.6 \times 10^3 \times 10^5$.
  2. Next change the two powers of 10 into *one* power of 10.
     Since 3 plus 5 is 8, the power of 10 is 8.
     $4.6 \times 10^3 \times 10^5 = 4.6 \times 10^8$
     In scientific notation $4600 \times 10^5 = 4.6 \times 10^8$.

Practice:

Write each number in scientific notation.

1. 16×10^{-5} _____

2. 16×10^5 _____

3. 25.1×10^{-8} _____

4. 0.15×10^7 _____

5. 374 _____

6. 528×10^{-6} _____

7. 0.25 _____

8. 0.153×10^{-2} _____

9. 11.34×10^{-7} _____

Name _____

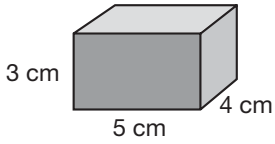
Reteaching 70

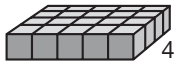
Math Course 2, Lesson 70

• Volume

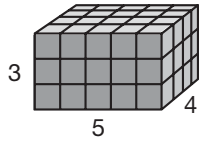
- **Volume** is the space occupied by a shape.
- The units used to measure volume are cubes of certain sizes.
- Volume is expressed in cubic units.
- To find the volume of a rectangular prism:
  1. Find the number of cubes in one layer of a rectangular prism.
  2. Multiply that by the number of layers in the prism.

Example: Find the number of 1-cm cubes that can fit in the box shown.





one layer



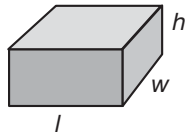
$$\frac{\text{layers}}{\text{cubes}} = \frac{1}{20} = \frac{3}{?}$$

$$20 \times 3 = 60 \text{ cubes}$$

$$5 \times 4 = 20 \text{ cubes}$$

The volume of this box can be written as 60 cm^3, 60 cu cm, or 60 cubic centimeters.

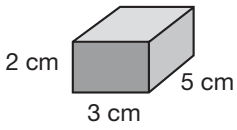
- The formula for finding the volume of a rectangular prism is $V = lwh$.



Practice:

Find the volume of each figure.

1.



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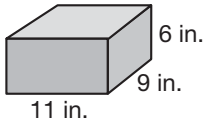
2.



_____

3. If the edge of a cube is 7 mm, what is the volume of the cube?

_____

4. A rectangular prism is 5 ft long, 7 ft wide, and 6 ft high. Sketch the figure and find its volume.

_____