

Math Busters Reproducible Worksheets

These worksheets practice math concepts explained in **Figuring Out Geometry** (ISBN: 978-0-7660-2880-7), written by **Rebecca Wingard-Nelson**.

Math Busters Figuring Out Geometry reproducible worksheets are designed to help teachers, parents, and tutors use the books from the Math Busters series in the classroom and the home. The answers to the problems are contained in the Answers section starting on page 59.

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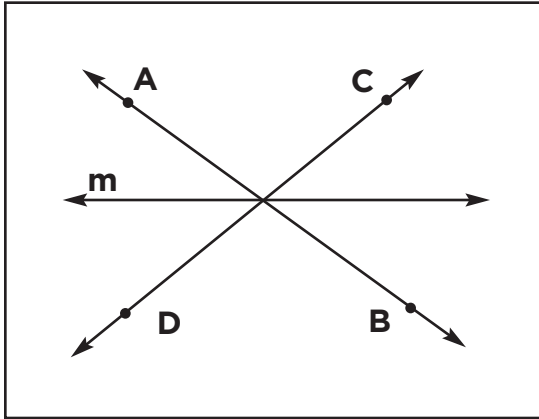
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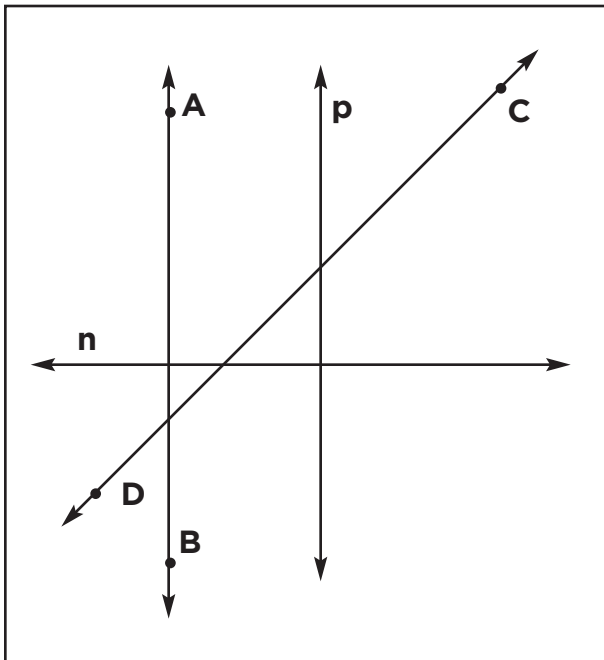
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Points, Lines, and Planes



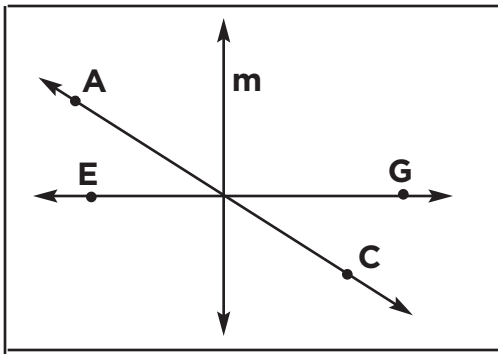
- a. Name four points.
- b. Name three lines.
- c. Name the plane.
- d. Name a horizontal line.



- e. Name a vertical line.
- f. Name an oblique line.
- g. Name all four lines.
- h. Name any four points.
- i. Name the plane.
- j. Name a horizontal line.

Points, Lines, and Planes

Use the correct symbols in your answers.



a. Name four points.

b. Name three lines.

c. Name the plane.

d. Name a horizontal line.

e. Name a vertical line.

f. What kind of line is line AC?

g. A straight set of points that extends forever in two directions is called a _____.

h. A(n) _____ names an exact location in space.

i. A flat surface that continues in all directions is called a _____.

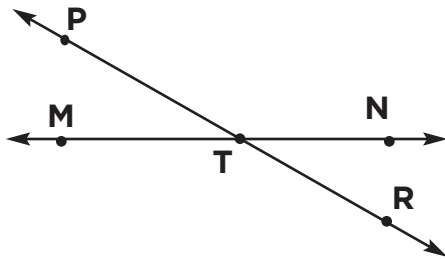
j. A(n) _____ line is not horizontal or vertical.

k. A(n) _____ line appears to go straight up and down.

l. A(n) _____ line appears to lie flat from left to right.

Rays and Line Segments

Use the drawing to answer the following questions.



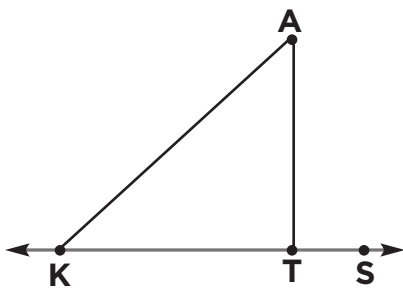
a. Name five rays.

b. Name five line segments.

c. Which can be measured, a ray or line segment? _____

d. A line segment has _____ end points.

Use the figure below for items e-i.



e. Name four line segments.

f. Name three rays.

g. Are \overrightarrow{TK} and \overrightarrow{KT} the same ray?

h. Are \overline{TA} and \overline{AT} the same line segment?

i. Are \overleftrightarrow{TK} and \overleftrightarrow{KT} the same line?

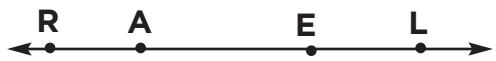
Rays and Line Segments

a. Draw a ray \overrightarrow{PQ} .

b. Draw a line segment \overline{RS} .



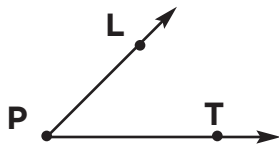
c. Name three rays.



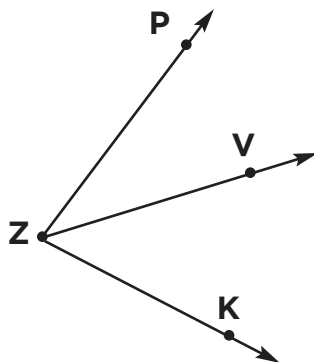
d. Name four line segments.



e. Name the ray.

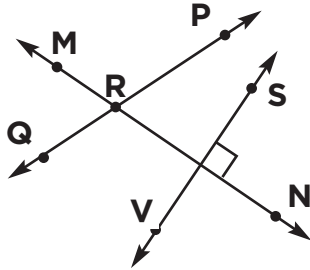


f. Name the two rays that make up this angle.



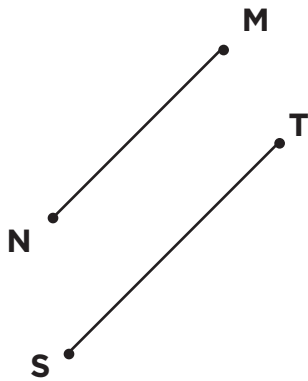
g. How many rays are in this figure?

Line relationships



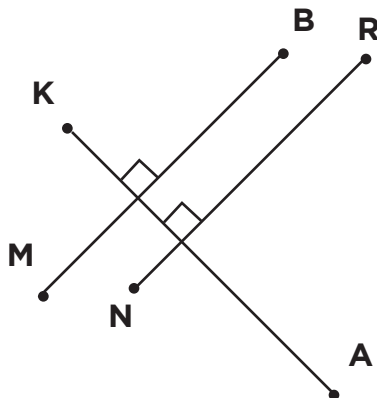
a. \overline{MN} intersects \overline{PQ} at _____.

b. \overline{SV} is _____ to \overline{MN} .



c. \overline{MN} and \overline{ST} are the same distance apart at all points. These lines are called _____.

d. Two lines in different planes that do not intersect and are not parallel are called _____.



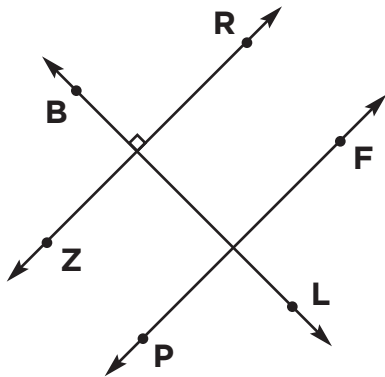
e. What is the relationship between \overline{KA} and \overline{NR} ?

They are _____.

f. What is the relationship between \overline{MB} and \overline{NR} ?

They are _____.

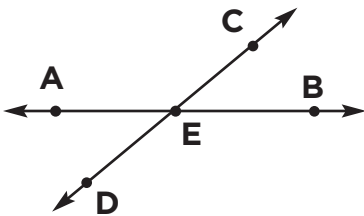
Line Relationships



a. What line intersects \overleftrightarrow{ZR} ?

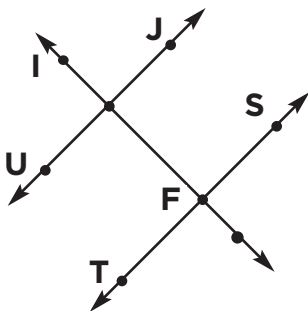
b. \overleftrightarrow{BL} is _____ to \overleftrightarrow{FP} .

c. Lines that are always the same distance apart are called _____.



d. Point E is called the point of _____.

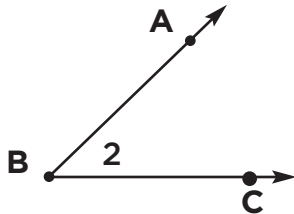
e. What does the symbol \perp mean?



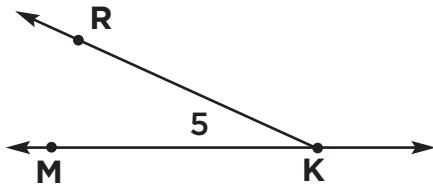
f. \overleftrightarrow{JU} and \overleftrightarrow{ST} are parallel. Write this using a symbol.

g. If all four angles at an intersection are right angles, the two lines are called _____.

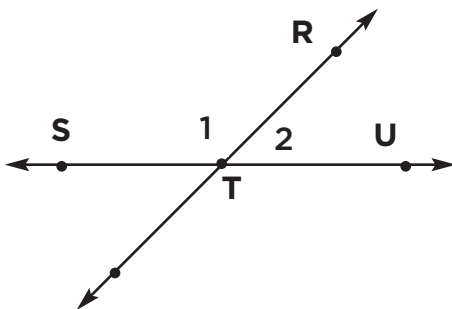
Angles



- a. Name this angle in three ways.
- b. What is the vertex of this angle?
- c. Name the two rays.



- d. Do $\angle RKM$ and $\angle MKR$ name the same angle?
- e. Name $\angle RKM$ without using letters.



- f. Name $\angle 1$ using three letters.
- g. Classify $\angle 1$ by its measurement.
- h. Classify $\angle 2$ by its measurement.
- i. Classify $\angle STU$ by its measurement.

Name _____

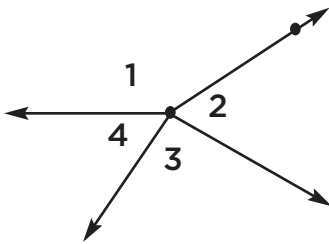
Date _____

Angles

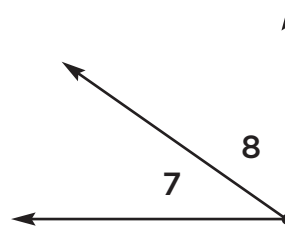
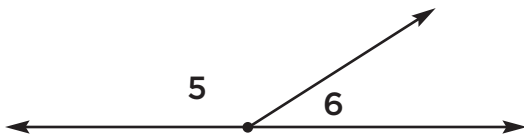
- a. Angles that measure less than 90° are called _____ angles.
- b. Angles that measure greater than 90° , but less than 180° are called _____ angles.
- c. Angles that measure exactly 90° are called _____ angles.
- d. Angles that measure exactly 180° are called _____ angles.
- e. Angles that measure greater than 180° , but less than 360° are called _____ angles.
- f. Draw an acute angle.
- g. Draw a right angle.
- h. Draw an obtuse angle.
- i. Draw a reflex angle.

Angle Relationships

- a. Two angles that share a vertex and a side are called _____.
- b. If two angles are supplementary, their sum is _____.
- c. If two angles are complementary, their sum is _____.
- d. Angles that have the same measure are called _____.

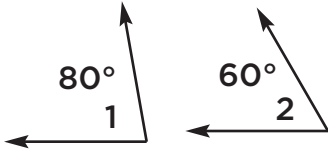


- e. What angles are adjacent to $\angle 1$?
- f. What angles are adjacent to $\angle 2$?

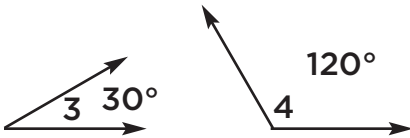


- g. In the figures above, which two angles are complementary?
- h. In the figures above, which two angles are supplementary?

Angle Relationships



a. Name the complementary angles.



b. Name the supplementary angles.

c. $\angle P$ and $\angle R$ are supplementary angles. If the measure of $\angle R$ is 37° , what is the measure of $\angle P$?

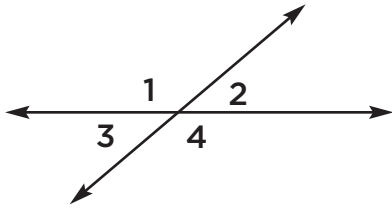
d. $\angle C$ and $\angle D$ are complementary angles. If the measure of $\angle C$ is 23° , what is the measure of $\angle D$?

e. $\angle A$ and $\angle B$ are congruent angles. If the measure of $\angle A$ is 65° , what is the measure of $\angle B$?

f. $\angle F$ and $\angle G$ are supplementary angles. If they are also congruent, what is the measure of $\angle F$?

g. $\angle X$ and $\angle Y$ are complementary angles. If they are also congruent, what is the measure of $\angle X$?

Angles of Intersecting Lines



- a. Name two linear pairs.
b. Name two sets of vertical angles.

Circle the correct answer.

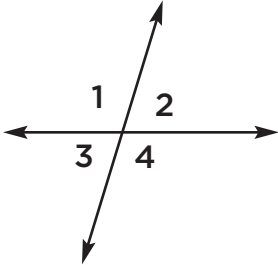
- c. Linear pairs are always **congruent complementary supplementary**.
d. Vertical angles are always **congruent complementary supplementary**.

Use the following to fill in the blanks for e-j.

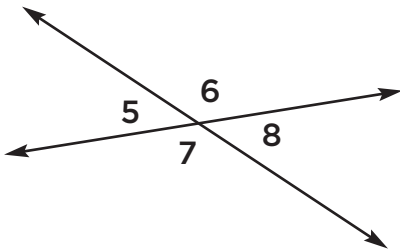
point of intersection	360°	vertical angles
linear pairs	180°	intersecting

- e. _____ are the adjacent angles where two lines intersect.
f. Where lines cross is the _____.
g. The four angles where two lines intersect have a sum of _____.
h. Lines that cross are _____.
i. The angle sum of a linear pair is _____.
j. _____ are the opposite angles where two lines intersect.

Angles of Intersecting Lines



- a. The measure of $\angle 2$ is 73° .
What is the measure of $\angle 1$?
- b. The measure of $\angle 2$ is 73° .
What is the measure of $\angle 4$?
- c. The measure of $\angle 2$ is 73° .
What is the measure of $\angle 3$?



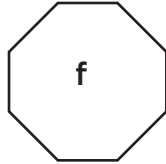
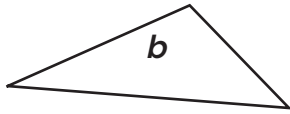
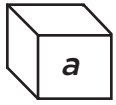
- d. Name two pairs of vertical angles.
_____ and _____
_____ and _____
- e. Name four linear pairs.
_____ and _____
_____ and _____
_____ and _____
_____ and _____

f. $\angle 1$ and $\angle 2$ are vertical angles.
The measure of $\angle 1$ is 113° .
What is the measure of $\angle 2$?

g. $\angle 1$ and $\angle 2$ are a linear pair.
The measure of $\angle 1$ is 113° .
What is the measure of $\angle 2$?

Plane Figures

Use figures a-f to answer the following questions.



a. Is figure e a polygon?

b. Figure ____ is an open figure.

c. Which figure is NOT a plane figure?

d. Which figure is a regular polygon?

e. How many polygons are there?

f. What polygon has four sides?

g. What polygon has three sides?

h. What polygon has eight equal sides?

i. An octagon has _____ sides.

j. A decagon has _____ angles.

k. A pentagon has _____ sides and _____ angles.

l. The line segments that form a polygon are called _____.

m. Where line segments meet on a polygon is called a _____.

Name _____

Date _____

Plane Figures

a. Draw an example of an open figure.

b. Draw an example of a closed figure.

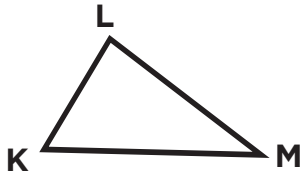
c. Draw an example of a plane figure that is NOT a polygon.

d. Draw an example of a plane figure that is a polygon.

e. Draw an example of a regular polygon.

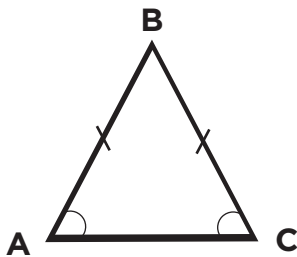
f. Draw an example of a polygon that is NOT regular.

Triangles



a. Name the triangle.

b. $\angle K + \angle L + \angle M =$ _____ $^{\circ}$



c. In $\triangle ABC$ the hash marks on \overline{AB} and \overline{BC} mean that the sides are _____.

d. The marks at $\angle A$ and $\angle C$ mean that the angles are _____.

e. If $\angle A$, $\angle B$ and $\angle C$ are all less than 90° , $\triangle ABC$ is _____.

f. A right triangle has one angle that measures _____.

g. An obtuse triangle has one angle that measures _____.

h. A triangle with three equal sides is called _____.

i. A triangle with two equal sides is called _____.

j. A triangle with no equal sides is called _____.

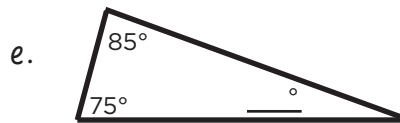
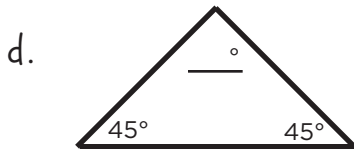
Triangles

Find the missing angle measure for each triangle.

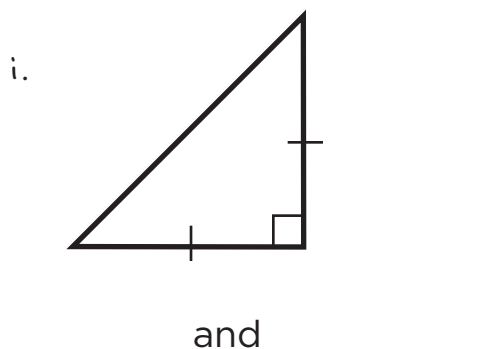
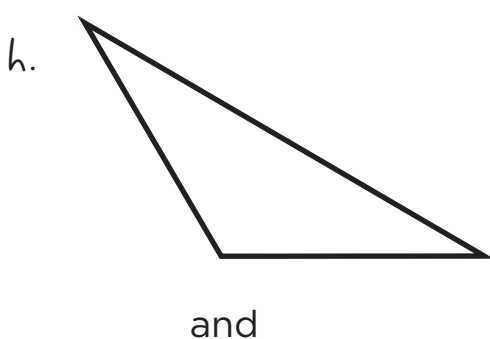
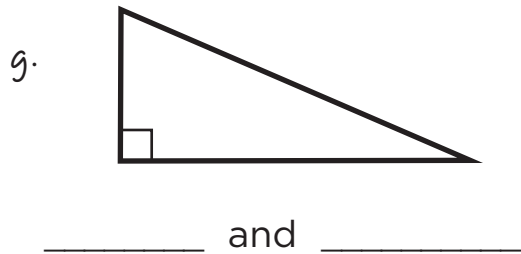
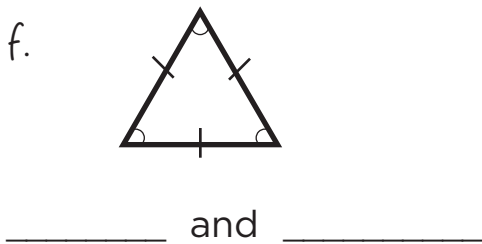
a. $\triangle ABC$: $m\angle A = 27^\circ$, $m\angle B = 90^\circ$ $m\angle C = \underline{\hspace{2cm}}$

b. $\triangle ABC$: $m\angle B = 120^\circ$, $m\angle C = 30^\circ$ $m\angle A = \underline{\hspace{2cm}}$

c. $\triangle ABC$: $m\angle A = 62^\circ$, $m\angle C = 54^\circ$ $m\angle B = \underline{\hspace{2cm}}$

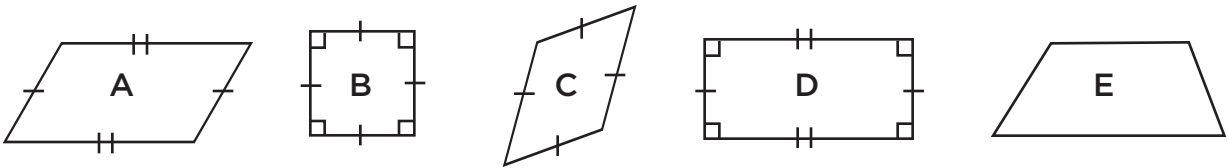


Classify each triangle by both its angle measures and side lengths.



Quadrilaterals

a. Any polygon with four sides is called a _____.



Use figures A-E to answer the following questions.

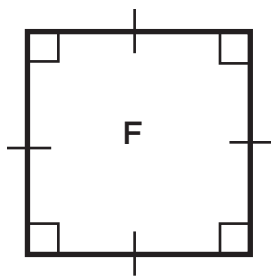
b. Which quadrilaterals can be called squares? _____

c. Which can be called rectangles? _____

d. Which is a rhombus? _____

e. The most specific name for figure E is a _____.

Use the following questions to classify figure F.



f. Is this figure a kite? _____

g. Is this figure a trapezoid? _____

h. Is this figure a parallelogram? _____

i. Is this figure a rectangle? _____

j. Is this figure a square? _____

k. This figure can be called a _____, a _____,
a _____, and a _____.

Name _____

Date _____

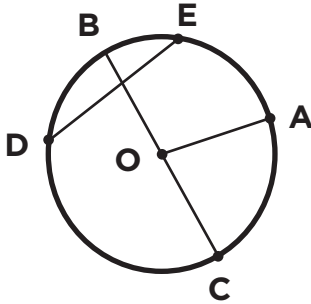
Quadrilaterals

- a. A kite has two distinct pairs of _____ sides that are _____.
- b. A parallelogram has two pairs of _____ sides.
- c. A rectangle has four _____ angles.
- d. A square is a rectangle with four _____ sides.
- e. Draw an example of a kite.
- f. Draw an example of a trapezoid.

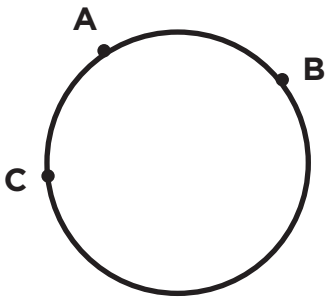
The table below gives the measurement of three angles in a quadrilateral. Find the measurement of the missing angle.

Quadrilateral ABCD	$m\angle A$	$m\angle B$	$m\angle C$	$m\angle D$
g.	78°	87°	99°	_____
h.	95°	88°	_____	103°
i.	100°	_____	125°	118°
j.	_____	37°	135°	77°

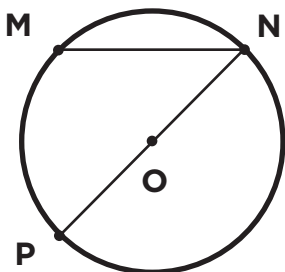
Circles



- a. Point O is the _____ of the circle.
- b. Name a diameter of the circle.
- c. Name two radii of the circle.
- d. $\angle BOA$ is a _____ angle.
- e. \overline{DE} is a _____.
- f. In $\angle COA$, point O is the _____.

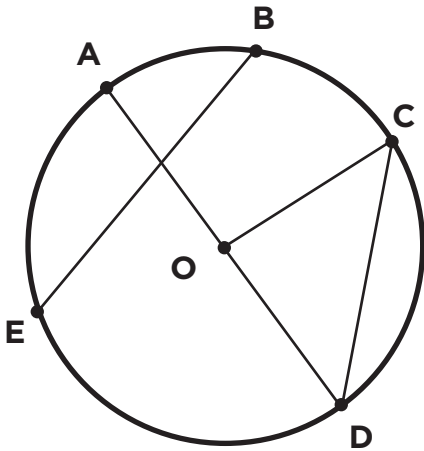


- g. Arc AC is a _____ arc.
- h. Name a minor arc. _____
- i. Arc BAC is a _____ arc.



- j. Arc MPN is a _____ arc.
- k. If \overline{ON} is 5 m how long is \overline{NP} ? _____
- l. \overline{PN} is a _____ of the circle.
- m. Name a semicircle. _____

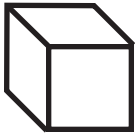
Circles



- a. The center of the circle is point _____.
- b. Name a central angle. _____
- c. \overline{BE} is a(n) _____.
- d. \overline{AD} is a(n) _____.
- e. \overline{OA} is a(n) _____.
- f. How many radii are drawn? _____

- g. How many chords are drawn?
- h. How many diameters are drawn?
- i. Arc AB is a _____ arc.
- j. Arc ADE is a _____ arc.
- k. Arc ACD is a _____.
- l. The vertex of every central angle is the _____ of the circle.
- m. If the radius of a circle is 3.6 mm, the diameter is _____.
- n. If the radius of a circle is 18 cm, the diameter is _____.
- o. If the radius of a circle is $5\frac{1}{2}$ feet, the diameter is _____.
- p. If the diameter of a circle is 11.6 m, the radius is _____.
- q. If the diameter of a circle is 1 in, the radius is _____.

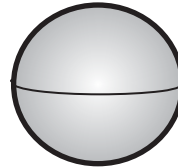
Prisms



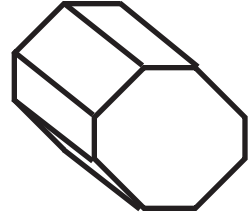
A



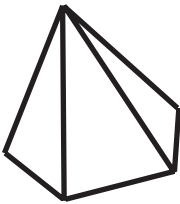
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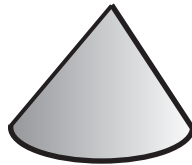
C



D



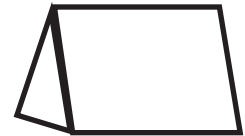
E



F



G

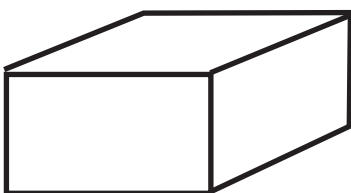


H

a. Which figures are solid figures? _____

b. Which figures are polyhedrons? _____

c. Which figures are prisms? _____



d. How many faces does this prism have? ____

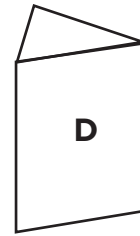
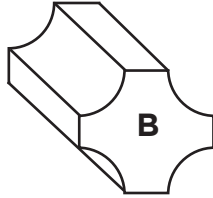
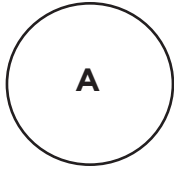
e. How many bases does this prism have? ____

f. How many edges does this prism have? ____

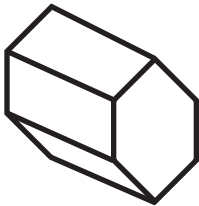
g. How many vertices does this prism have? ____

h. What type of prism is this? _____

Prisms



a. Which figures above are polyhedrons? _____



b. How many faces are there on the figure on the left?

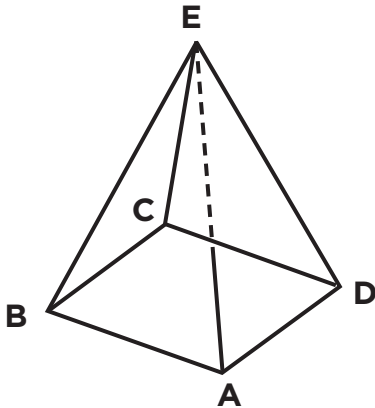
c. How many edges are there?

d. How many vertices are there?

	Base Shape	Faces = base sides + 2	Edges = base sides x 3	Vertices = base sides x 2
e.	Square			
f.	Pentagon			
g.	Nonagon			
h.	Dodecagon			

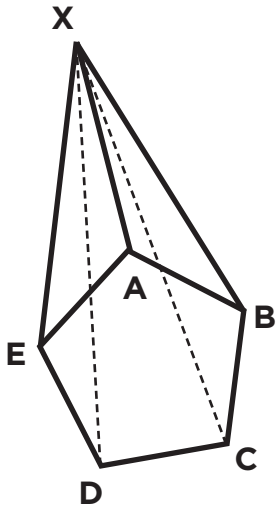
Complete the chart with the number of faces, edges, and vertices.

Pyramids



- a. What type of pyramid is on the left?
- b. $\triangle ABE$ is what part of the figure?
- c. \overline{AE} is a(n) _____ of the figure.
- d. Point E is the _____.
- e. How many vertices are in the above pyramid?
- f. Name the base in the above pyramid.
- g. A pyramid has _____ base(s).
- h. What shape is a lateral face on any pyramid?
- i. How many faces are there on a pyramid whose base has 16 sides?
- j. How many vertices are there on a pyramid whose base has 9 sides?

Pyramids



- a. What shape is the base? _____
- b. How many lateral faces are there? _____
- c. How many edges are there? _____
- d. Point X is called the _____ .

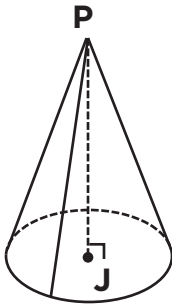
e. What shape is each lateral face? _____

f. Name each lateral face.

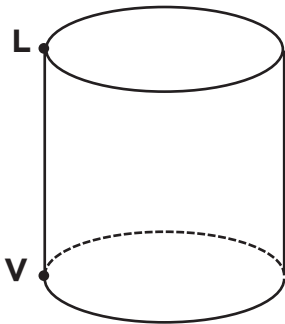
Complete the chart with the number of faces, edges, and vertices.

	Base Shape	Faces = base sides + 1	Edges = base sides x 2	Vertices = base sides + 1
g.	Triangle			
h.	Decagon			
i.	Dodecagon			
j.	20-sided			

Cones and Cylinders

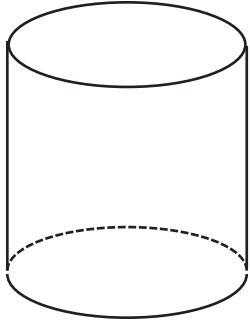


- a. How many lateral faces does a cone have?
- b. The height of the cone is a line segment that is _____ to the base.
- c. In a right circular cone, the height is measured at the _____ of the circular base.
- d. \overline{PJ} is the _____.
- e. Point P is the _____.

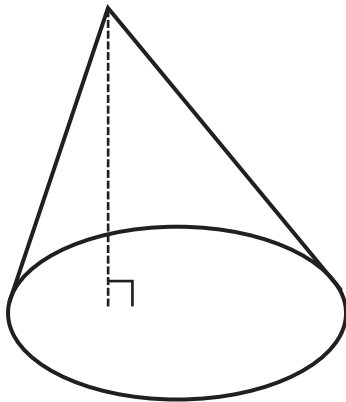


- f. The figure on the left is a _____.
 - g. What shape is the lateral face of this figure?
 - h. The shape of a base is a(n) _____.
- i. \overline{LV} is the _____.
 - j. How many bases does a cone have? _____
 - k. How many bases does a cylinder have? _____

Cones and Cylinders



- a. If you unroll the lateral face of a cylinder, what shape do you have?
- b. What shape are the bases of a cylinder?
- c. How many vertices are there on a cylinder?



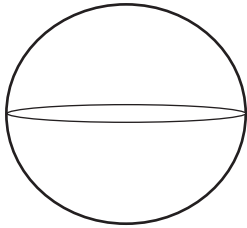
- d. The dotted line shows the _____ of the cone.
- e. Is this a right circular cone? _____

- f. Name two common items that are shaped like a cylinder.
- g. Name two common items that are shaped like a cone.

Name _____

Date _____

Spheres



a. How many bases are on a sphere? _____

b. How many lateral faces on a sphere? _____

c. What shape is a cross section of a sphere? _____

d. The largest cross section of a sphere passes through the _____ of the sphere.

e. Are all cross sections of a sphere the same size? _____

f. What is the difference between a sphere and a circle?

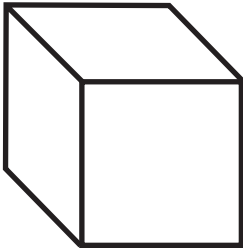
g. Name three common items that are shaped like a sphere.

Name _____

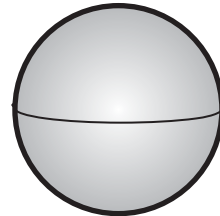
Date _____

Spheres

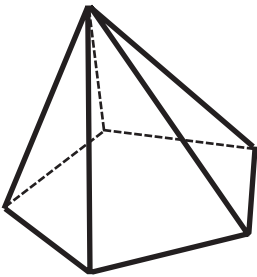
Classify each of the following shapes.



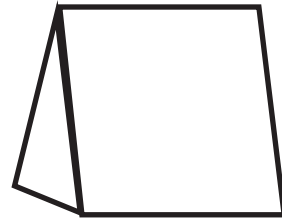
a. _____



b. _____



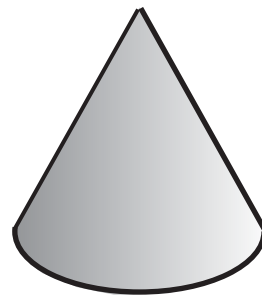
c. _____



d. _____



e. _____



f. _____

Name _____

Date _____

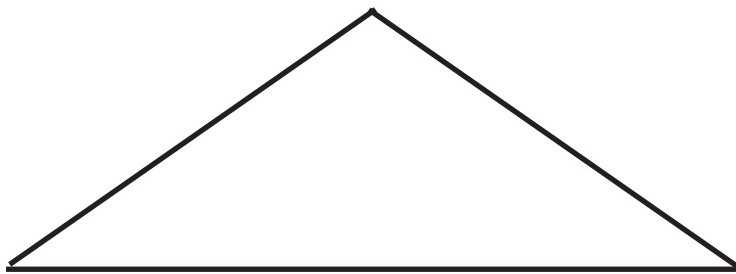
Line Symmetry

Draw all of the lines of symmetry on each figure.

a.



b.

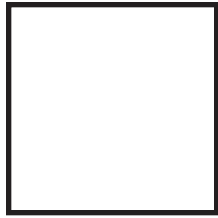


c. The letters in the word MATH are all symmetrical. Are the letters in your name symmetrical? (Use capital letters.)

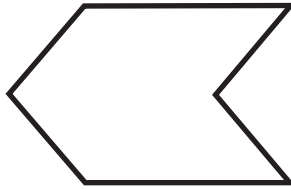
d. Which of the numerals 0 - 9 are symmetrical?

Line Symmetry

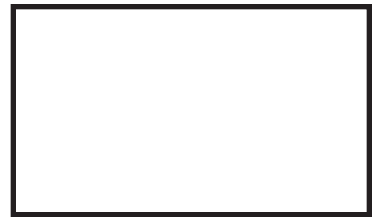
Draw all of the possible lines of symmetry for each figure.



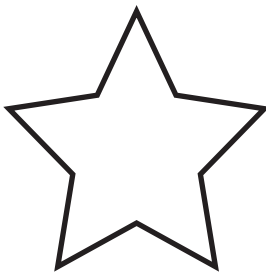
A



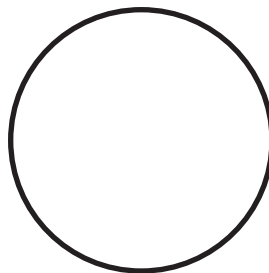
B



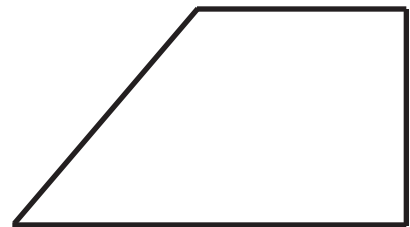
C



D



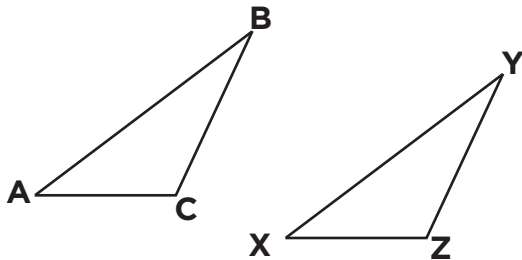
E



F

- Which figures have no lines of symmetry? _____
- Which figures have only one line of symmetry? _____
- Which figures have exactly two lines of symmetry? _____
- Which figures have three or more lines of symmetry? _____
- Which figure has the most lines of symmetry? _____

Congruence



$\triangle ABC \cong \triangle XYZ$

Corresponding sides:

a. $\overline{AB} \cong$ _____

b. $\overline{BC} \cong$ _____

c. $\overline{CA} \cong$ _____

Corresponding angles:

d. $\angle A \cong$ _____

e. $\angle B \cong$ _____

f. $\angle C \cong$ _____

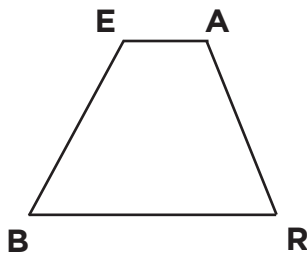
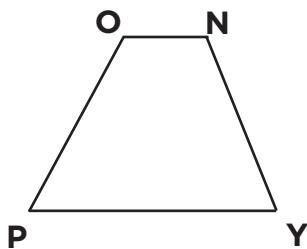


Figure PONY \cong Figure BEAR

Corresponding sides:

g. $\overline{PO} \cong$ _____

h. $\overline{ON} \cong$ _____

i. $\overline{NY} \cong$ _____

j. $\overline{YP} \cong$ _____

Corresponding angles:

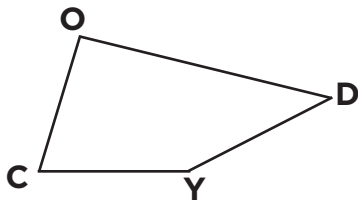
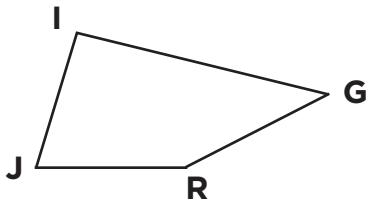
k. $\angle P \cong$ _____

l. $\angle O \cong$ _____

m. $\angle N \cong$ _____

n. $\angle Y \cong$ _____

Congruence



a. $\overline{JI} \cong$ _____

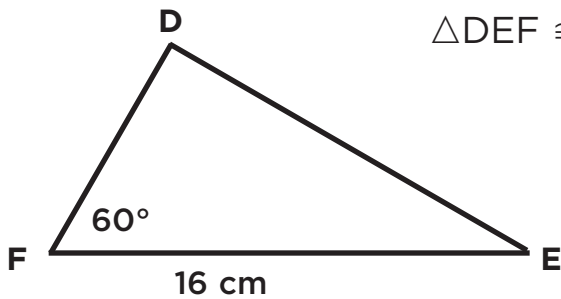
b. $\overline{CY} \cong$ _____

c. $\angle R \cong$ _____

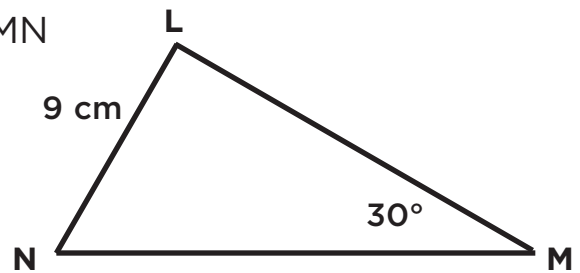
d. $\angle D \cong$ _____

Figure JIGR \cong Figure CODY

e. $\overline{RJ} \cong$ _____



$\triangle DEF \cong \triangle LMN$



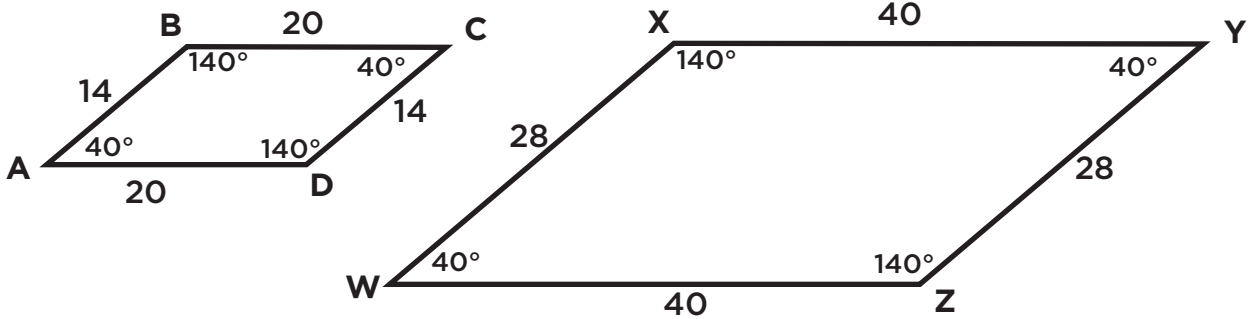
f. $\overline{FD} \cong$ _____, so the measure of \overline{FD} is _____.

g. $\overline{NM} \cong$ _____, so the measure of \overline{NM} is _____.

h. $\angle N \cong$ _____, so the measure of $\angle N$ is _____.

i. $\angle E \cong$ _____, so the measure of $\angle E$ is _____.

Similarity



- a. List the corresponding angles. _____ \cong _____
 _____ \cong _____
 _____ \cong _____
 _____ \cong _____

b. Write a ratio of the lengths for each pair of corresponding sides.

$$\frac{\text{length of AB}}{\text{length of WX}} = \text{---} = \text{---}$$

$$\frac{\text{length of BC}}{\text{length of XY}} = \text{---} = \text{---}$$

$$\frac{\text{length of CD}}{\text{length of YZ}} = \text{---} = \text{---}$$

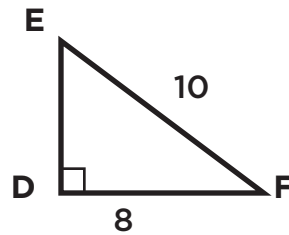
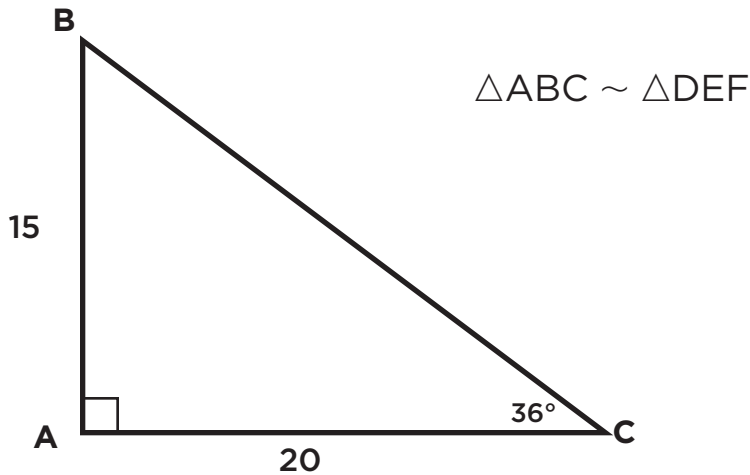
$$\frac{\text{length of DA}}{\text{length of ZW}} = \text{---} = \text{---}$$

c. Are figures ABCD and WXYZ similar? _____

d. Similar figures have the same _____, but do not have to be the same _____.

Similarity

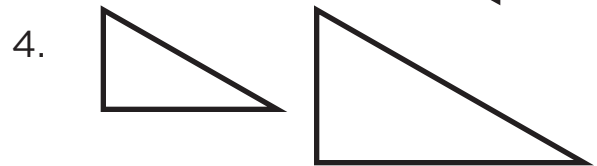
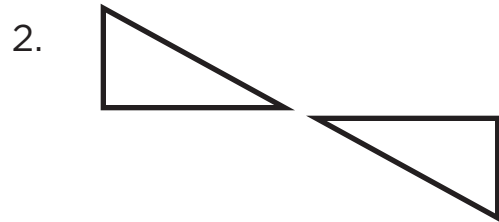
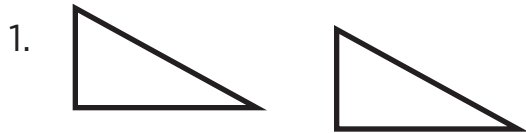
- a. The corresponding angles of similar figures are _____.
- b. The corresponding sides of similar figures are _____.



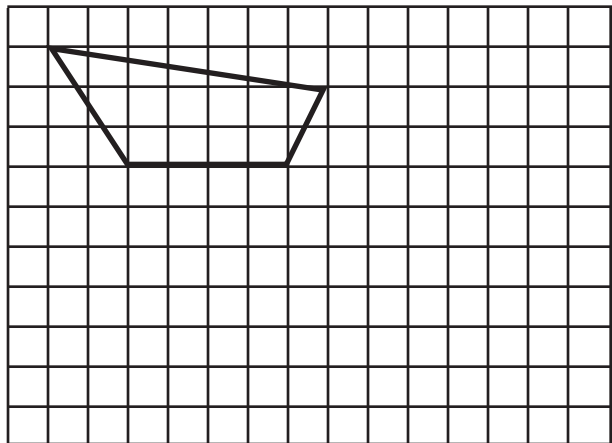
- c. The measure of $\angle F$ is _____.
- d. The measure of $\angle B$ is _____.
- e. The measure of $\angle E$ is _____.
- f. $\frac{\text{length of AC}}{\text{length of DF}} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$
- g. length of DE = _____
- h. length of BC = _____

Slides (Translations)

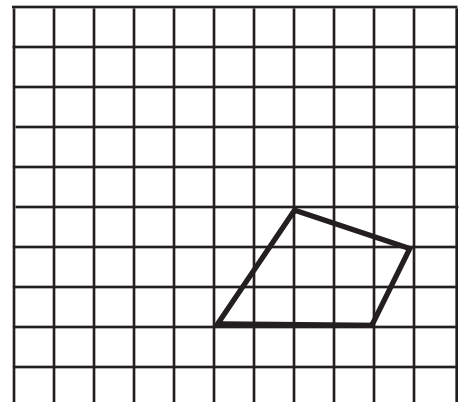
a. Which pair of triangles shows a slide? Pair _____



b. Translate the figure 6 units right and 6 units down.

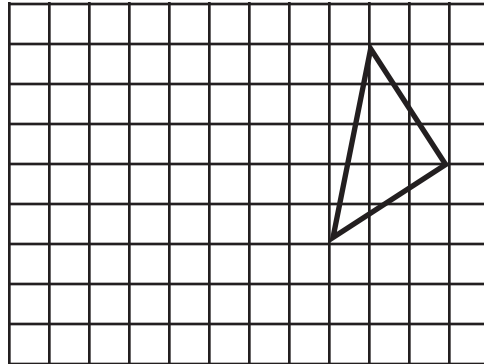


c. Translate the figure 4 units left and 5 units up.

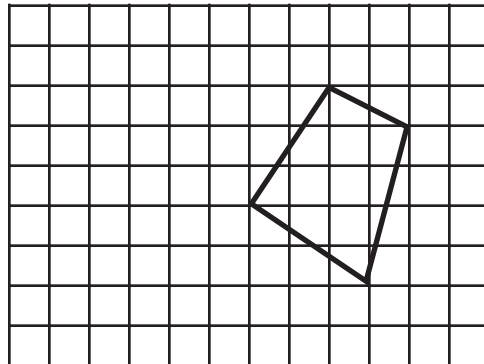


Slides (Translations)

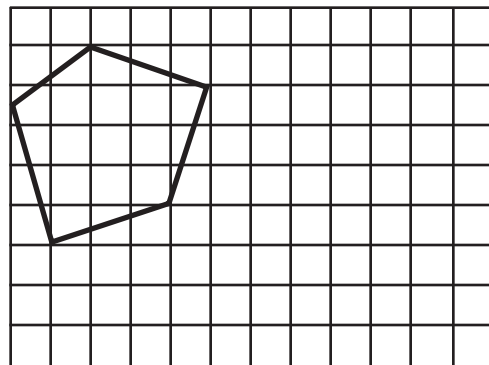
- a. Translate the figure 5 units left.



- b. Slide the figure 4 spaces left and 1 space up.

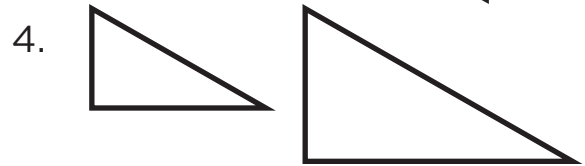
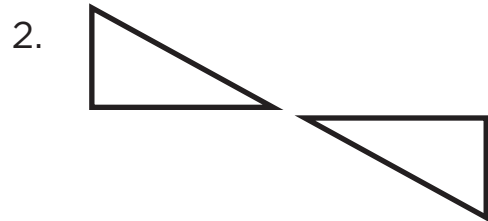


- c. Slide the figure 6 spaces right and 3 spaces down.

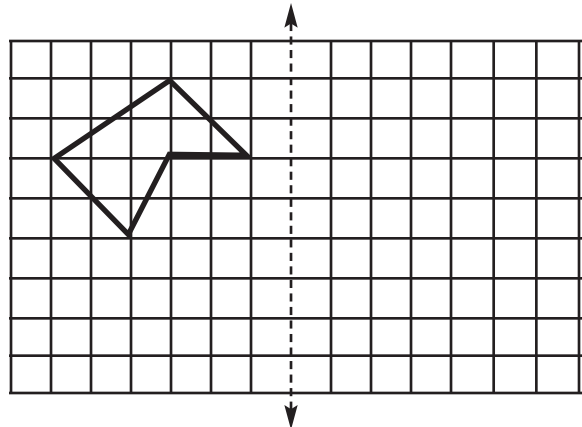


Flips (Reflections)

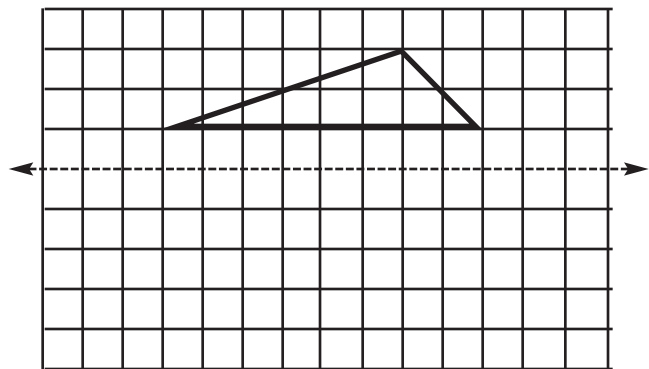
a. Which pair of triangles shows a flip? Pair _____



b. Reflect the figure across the given line of reflection.

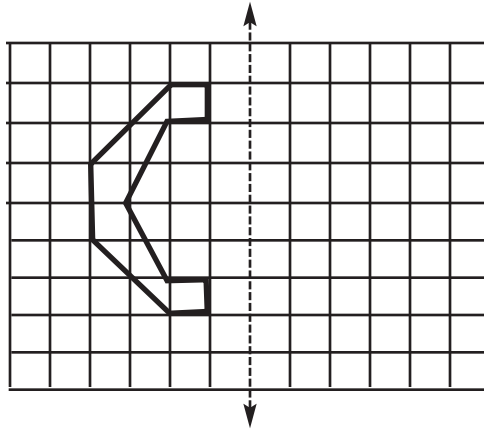


c. Reflect the triangle across the given line of reflection.

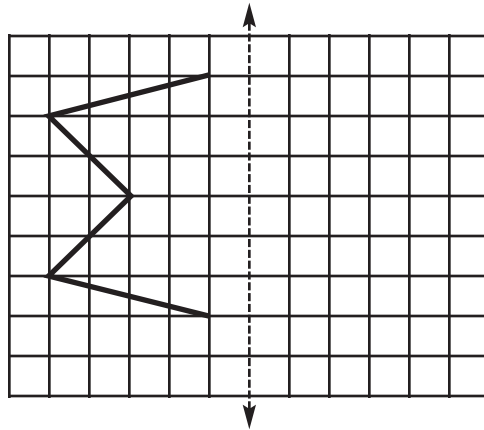


Flips (Reflections)

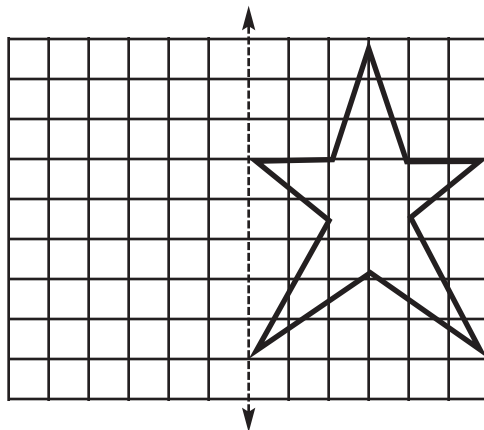
- a. Flip the figure using the given line of reflection.



- b. Reflect the figure across the given line of reflection.

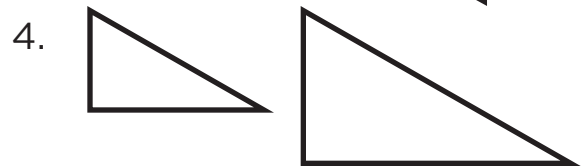
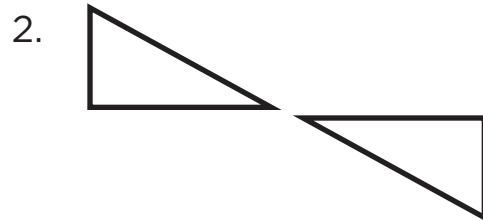


- c. Flip the figure using the given line of reflection.

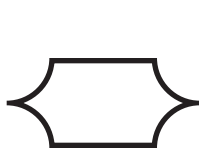


Turns (Rotations)

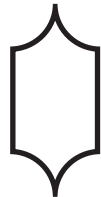
a. Which pair of triangles shows a turn? Pair _____



b. Which of the following figures is a 90° rotation of figure A? ____



A



1



2



3

c. What are the three types of transformation that do not change the shape or size of a figure?

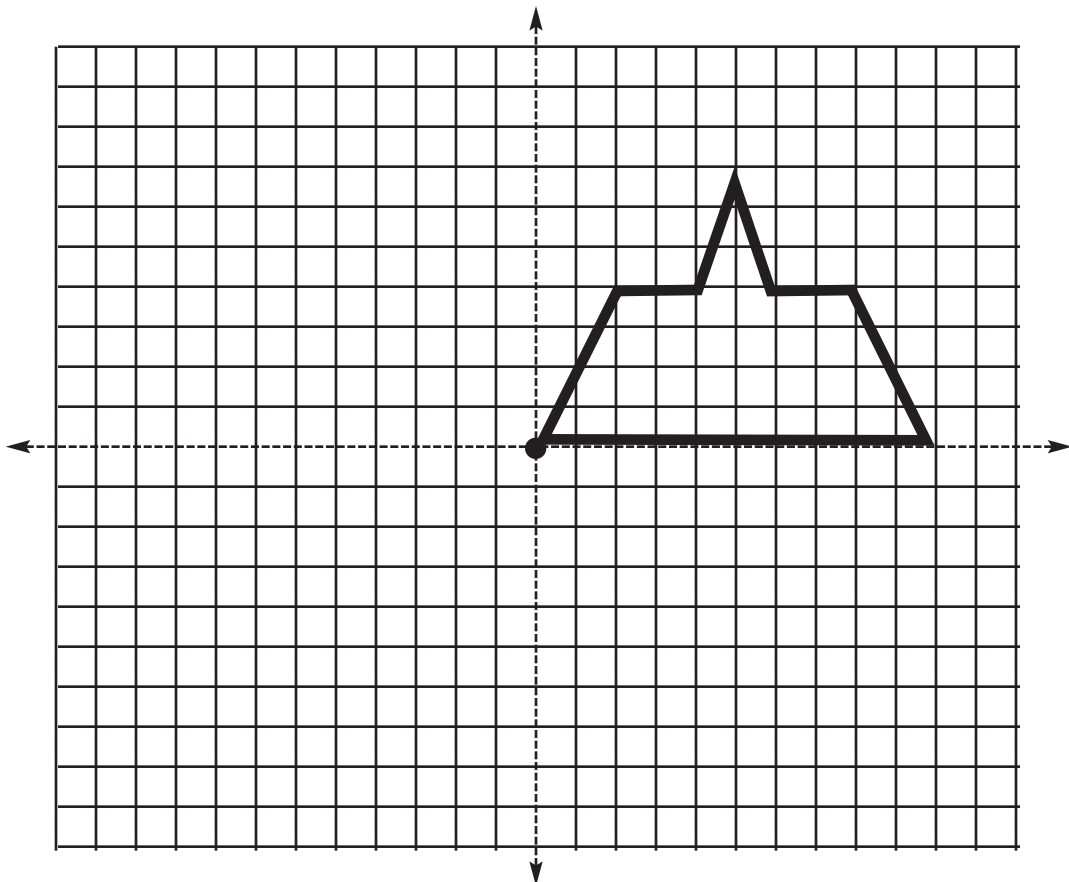
d. How many degrees in a full rotation? _____

e. In a rotation, the figure turns around a _____ or _____.

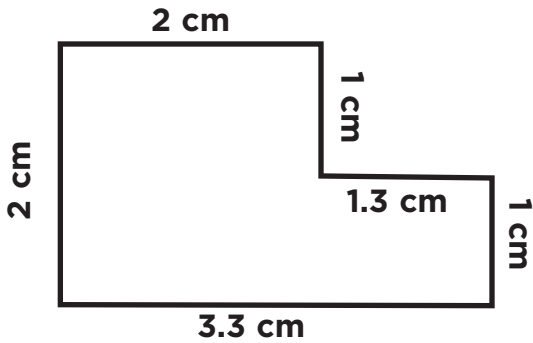
Turns (Rotations)

a. Draw a figure with rotational symmetry.

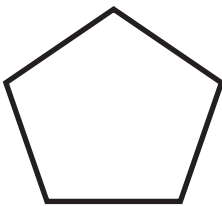
b. Rotate the figure around the given point of rotation clockwise 90° (quarter turn), 180° (half turn), and 270° (three-quarter turn).



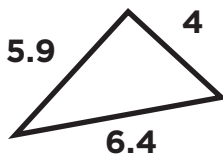
Perimeter



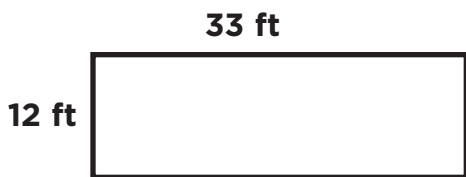
a. Find the perimeter of the figure.



b. This figure is a regular pentagon. If one side is 4 feet long, what is the perimeter?



c. Find the perimeter of the triangle.

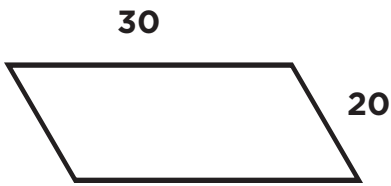


d. Find the perimeter of the rectangle.



e. Find the perimeter of the square.

Perimeter



- a. Find the perimeter of the parallelogram.

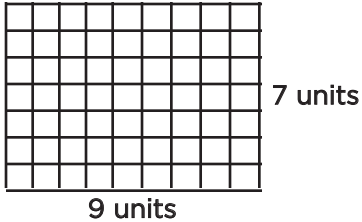
Find the missing measurements in each table.

RECTANGLE	length	width	perimeter
b.	4 ft	2 ft	_____
c.	_____	3 in	16 in
d.	6.5 m	4.1 m	_____

SQUARE	side	perimeter
e.	6 m	_____
f.	_____	12 mm
g.	3.2 cm	_____

Triangle	side 1	side 2	side 3	perimeter
h.	3 ft	4 ft	5 ft	_____
i.	_____	10 in	13 in	29 in
j.	5.7 miles	4.1 miles	4.9 miles	_____

Area: Rectangles and Squares



- a. Find the area of the rectangle.
Remember, area is the number of square units needed to cover a figure.

b. To find the area of a rectangle, you can multiply the _____ by the _____.

c. To find the area of a square you can multiply the length of a _____ by itself.

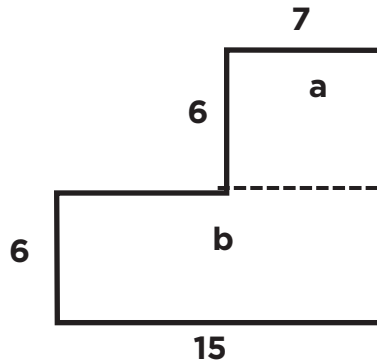
Find the missing measurements in each table.

RECTANGLE	length	width	area
d.	8 mm	5 mm	_____
e.	9 cm	6 cm	_____
f.	12 in	3 in	_____
g.	_____	8 in	40 in ²

SQUARE	side length	area
h.	9 cm	_____
i.	14 in	_____
j.	_____	64 in ²

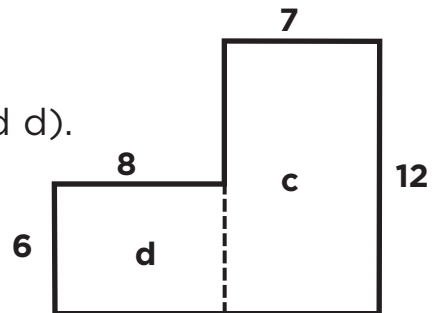
Area: Rectangles and Squares

Find the area of the composite figures using the information you are given.

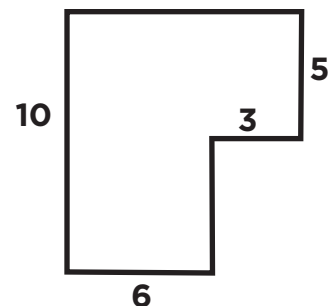


- a. Area of total figure = area of section a + area of section b
 Area of total figure = $(6 \times 7) + (6 \times 15)$
 Area of total figure =

- b. Find the area of the same figure using different sections (sections c and d).



- c. Find the area of the composite figure.



Name _____

Date _____

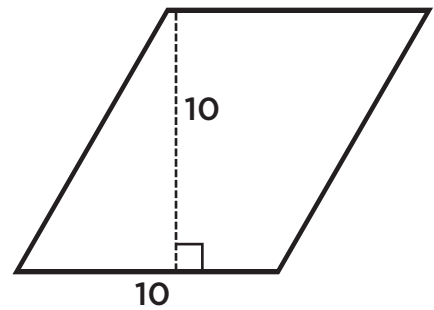
Area: Parallelograms

- a. To find the area of a parallelogram, multiply the _____ by the _____.

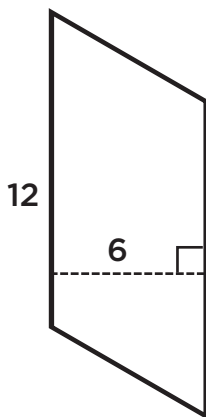
Find the area of each parallelogram.



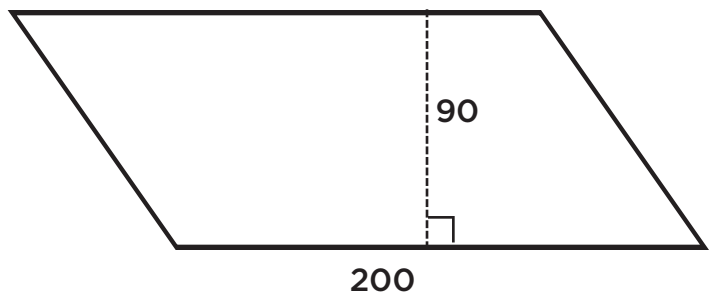
b. Area = _____



c. Area = _____



d. Area = _____



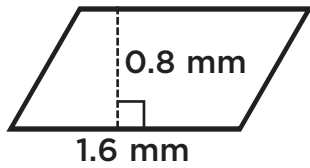
e. Area = _____

Name _____

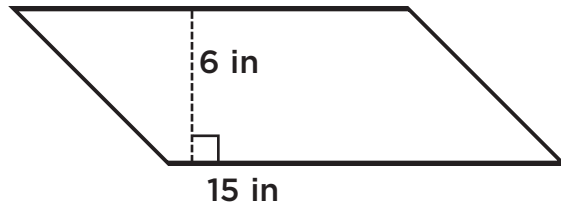
Date _____

Area: Parallelograms

Find the area of each parallelogram.



a. Area = _____



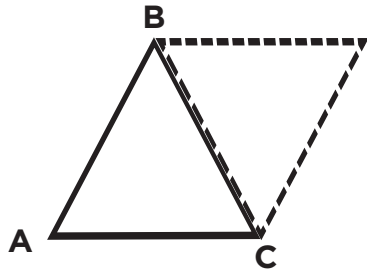
b. Area = _____

Complete the following table.

PARALLELOGRAM	base	height	area
c.	17 m	20 m	_____
d.	3.5 cm	8 cm	_____
e.	1/2 in	3/4 in	_____
f.	62 ft	12 ft	_____
g.	3 in	_____	27 in ²
h.	_____	4 in	16 in ²

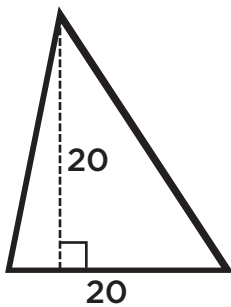
Area: Triangles

- a. $\triangle ABC$ was copied, turned, and pushed up against itself. What new shape was formed?

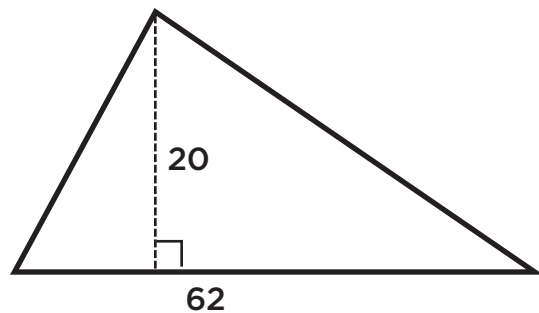


- b. The area of $\triangle ABC$ is _____ the area of the new parallelogram.
- c. To find the area of a triangle, multiply _____ \times _____ \times _____.
- d. The height of a triangle is a _____ line segment from the _____ to the _____ across from it.

Find the area of each triangle.



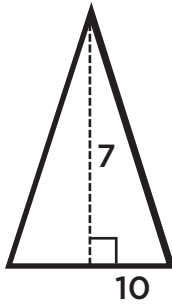
e. Area = _____



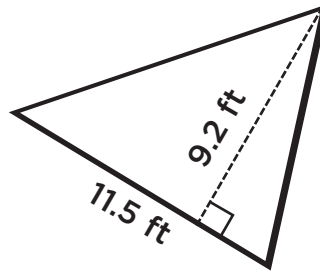
f. Area = _____

Area: Triangles

Find the area of each triangle.



a. Area = _____



b. Area = _____

Complete the following table.

TRIANGLE	base	height	area
c.	11 m	12 m	_____
d.	1.2 cm	8 cm	_____
e.	1/2 in	3/4 in	_____
f.	100 ft	12 ft	_____
g.	3 in	_____	9 in ²
h.	_____	2 in	20 in ²

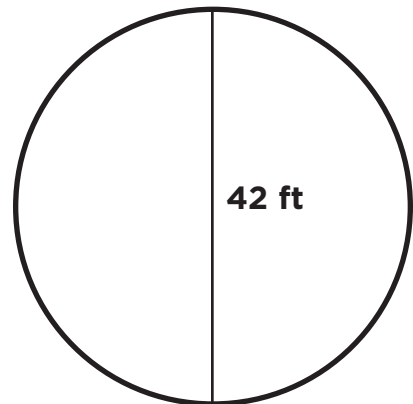
Circle Measurements

- a. Circumference is the _____ of a circle.
- b. The decimal 3.14 and the fraction $\frac{22}{7}$ are both used to approximate the infinite decimal that is known as _____.
- c. The formula for the circumference of a circle is $C =$ _____.
- d. The formula for the area of a circle is $A =$ _____.
- e. The symbol _____ means “approximately equal to.”
- f. Find the circumference of a circle with a diameter of 42 feet. (Hint: Use $\frac{22}{7}$ for π)

$$C \approx \underline{\hspace{2cm}}$$

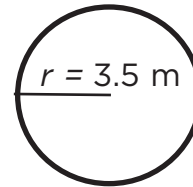
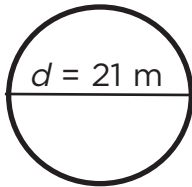
- g. Find the area of a circle with a diameter of 42 feet.

$$A \approx \underline{\hspace{2cm}}$$



Circle Measurement

Find the circumference and area for each circle.



$$a. \quad C = \pi d$$

$$C \approx \frac{22}{7}(21)$$

$$C \approx$$

$$A = \pi r^2$$

$$A \approx \frac{22}{7}(10\frac{1}{2})^2$$

$$A \approx \frac{22}{7}(10\frac{1}{2})(10\frac{1}{2})$$

$$A \approx$$

b.

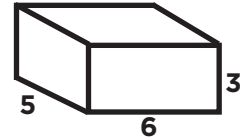
c. Find the circumference and area of a circle with a radius of 2 feet. Use $\pi = 3.14$.

d. Use $\pi = 3.14$ for this problem. Barney the dog is on a 15 ft. chain that is staked into the ground. If he runs around in the biggest circle he can one time, how far does he run?

e. Using the information from the last problem, how much room does Barney have to play when he is on his chain?

Nets and Surface Area

- a. Find the surface area of the rectangular prism. Remember, surface area is the total area of all of the faces.



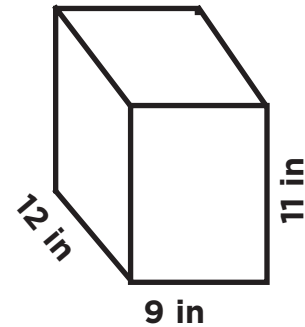
Surface Area = 2(area front face) + 2(area side face) + 2(area top face)

Surface Area = $2(w \times h) + 2(l \times h) + 2(l \times w)$

Surface Area = $2(6 \times 3) + 2(5 \times 3) + 2(5 \times 6)$

Surface Area =

- b. Find the surface area of the rectangular prism.



- c. What is the surface area of a cube with a side length of 10 cm?

Nets and Surface Area

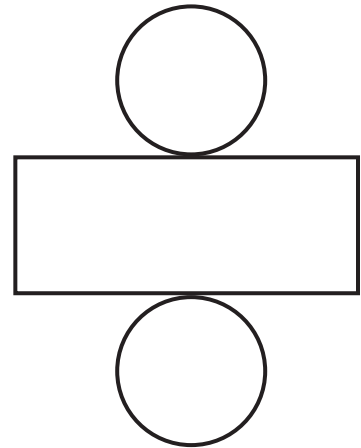
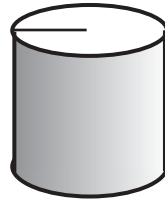
Use nets to help find the surface area of the following figures.

- a. Find the surface area of this cylinder. Use $\pi = 22/7$.

The net has already been drawn for you.

$$r = 7 \text{ in}$$

$$h = 12 \text{ in}$$



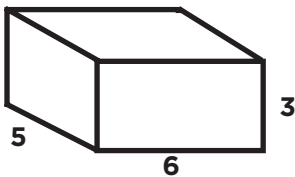
- b. Draw a net to find the surface area of a cube with a side length of 6 units.

Name _____

Date _____

Volume Prisms

- a. Volume is the amount of _____ something occupies.
- b. Volume is measured in _____ units.
- c. To find the volume of a rectangular prism, multiply _____ \times _____ \times _____.
- d. To find the volume of any prism, multiply _____ \times _____.
- e. Find the volume of the rectangular prism.



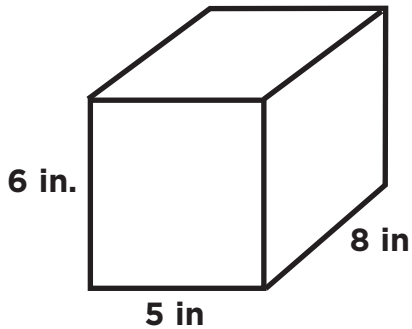
- f. What is the volume of a cube with a side length of 3 feet?
- g. What is the volume of a triangular prism with a height of 22 inches and base with an area of 12 square inches?

Name _____

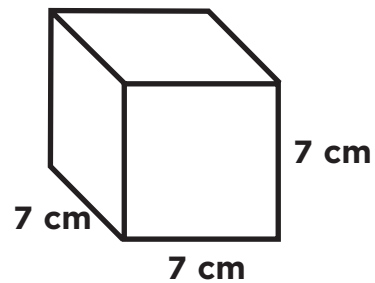
Date _____

Volume: Prisms

Find the volume of each prism.



a. Volume = _____



b. Volume = _____

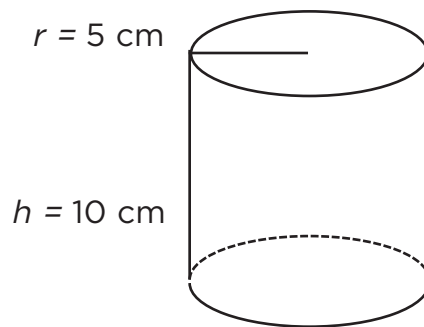
c. Joe is picking strawberries. His containers are rectangular prisms that are 5 inches wide, 5 inches long and 4 inches high. How much does each container hold?

d. A moving van is 36 feet long, 10 feet wide and 12 feet high. What is the volume of space inside?

Volume: Cylinders and Cones

- a. The volume of a cylinder has the same formula as the volume for any _____.
- b. The formula for the volume of a cylinder is _____ \times _____.

- c. Find the volume of the cylinder.
Use $\pi = 3.14$. (Hint: Find the area of the circular base first.)



- d. A tube has a diameter of 1 inch. If the tube is 12 inches long, what is the volume of the tube? Use $\pi = 3.14$.
- e. Mac's favorite mug is a cylinder that has a base area of 10 square inches and a height of 6 inches. How much coffee can be put in his mug?

Volume: Cylinders and Cones

- a. The volume of a circular cone is _____ the volume of a cylinder with the same base area and height. (Hint: It's a fraction.)
- b. Find the volume of a circular cone with a diameter of 6 inches and a height of 15 inches. Use $\pi = 3.14$.

Complete the following table. Use 3.14 for π . Round your answers to the nearest hundredth.

	Solid	Radius of base	Height	Area of base	Volume
c.	cylinder	4 cm	8 cm		
d.	cone	4 cm	8 cm		
e.	cylinder	6 mm	12 mm		
f.	cone	6 mm	12 mm		
g.	cylinder	9 in	10 in		
h.	cone	9 in	10 in		

Answers

Points, Lines and Planes

Page 3: a. points A, B, C, and D; b. line AB, line CD, and line m; c. plane (any three points); d. line m; e. line AB or line p; f. line CD; g. line AB, line CD, line n, and line p; h. points A, B, C, and D; i. plane (any three points); j. line n

Page 4: a. $\overset{\cdot}{A}$, $\overset{\cdot}{C}$, $\overset{\cdot}{E}$, and $\overset{\cdot}{G}$; b. \overleftrightarrow{AC} , \overleftrightarrow{EG} , and \overleftrightarrow{m} ; c. plane (any three points); d. \overleftrightarrow{EG} ; e. \overleftrightarrow{m} ; f. oblique; g. line; h. point; i. plane; j. oblique; k. vertical; l. horizontal

Rays and Line Segments

Page 5: a. Possible answers: ray PR, ray MN, ray NM, ray RP, ray TR, ray TN, ray TM, ray TP; b. Possible answers: line segment PT, line segment TR, line segment PR, line segment MN, line segment MT, line segment TN; c. a line segment; d. two; e. Possible answers: line segment AT, line segment KT, line segment KS, line segment AK, line segment TS; f. Possible answers: ray TK, ray SK, ray TS, and ray KS; g. No; h. Yes; i. Yes

Page 6: a-b. Check drawings; c. Possible answers: ray AD, ray TD, ray AT, and ray DT; d. Possible answers: line segment RA, line segment RE, line segment AE, line segment RL, line segment EL, line segment AL; e. ray KR; f. ray PL and ray PT; g. 3

Line Relationships

Page 7: a. point R; b. perpendicular; c. parallel; d. skew; e. perpendicular; f. parallel

Page 8: a. line BL; b. perpendicular; c. parallel; d. intersection; e. perpendicular; f. line JU \parallel line ST; g. perpendicular

Angles

Page 9: a. $\angle B$, $\angle ABC$, $\angle 2$ or $\angle CBA$; b. point B; c. ray BA and ray BC; d. Yes; e. $\angle 5$; f. $\angle RTS$ or $\angle STR$; g. $\angle 1$ is obtuse.; h. $\angle 2$ is acute.; i. $\angle STU$ is straight.

Page 10: a. acute; b. obtuse; c. right; d. straight; e. reflex; f-i. Check drawings.

Angle Relationships

Page 11: a. adjacent; b. 180° ; c. 90° ; d. congruent; e. $\angle 2$ and $\angle 4$; f. $\angle 1$ and $\angle 3$; g. $\angle 7$ and $\angle 8$; h. $\angle 5$ and $\angle 6$

Page 12: a. $\angle 2$ and $\angle 3$; b. $\angle 2$ and $\angle 4$; c. 143° ; d. 67° ; e. 65° ; f. 90° ; g. 45°

Angles of Intersecting Lines

Page 13: a. $\angle 1$ and $\angle 2$, $\angle 1$ and $\angle 3$, $\angle 2$ and $\angle 4$, or $\angle 3$ and $\angle 4$; b. $\angle 1$ and $\angle 4$, $\angle 2$ and $\angle 3$; c. supplementary; d. congruent; e. linear pairs; f. point of intersection; g. 360° ; h. intersecting; i. 180° ; j. vertical angles

Page 14: a. 107° ; b. 107° ; c. 73° ; d. $\angle 5$ and $\angle 8$, $\angle 6$ and $\angle 7$; e. $\angle 5$ and $\angle 6$, $\angle 6$ and $\angle 8$, $\angle 5$ and $\angle 7$, $\angle 7$ and $\angle 8$; f. 113° ; g. 67°

Plane Figures

Page 15: a. No; b. c; c. a; d. f; e. 3; f. d; g. b; h. f; i. 8; j. 10; k. 5, 5; l. sides; m. vertex

Page 16: a-f. Check drawings

Triangles

Page 17: a. $\triangle KLM$ (or LMK , MKL , LKM , KML , or MLK); b. 180° ; c. congruent; d. congruent; e. acute; f. 90° ; g. greater than 90° ; h. equilateral; i. isosceles; j. scalene

Page 18: a. 63° ; b. 30° ; c. 64° ; d. 90° ; e. 20° ; f. equiangular and equilateral; g. right and scalene; h. obtuse and scalene; i. right and isosceles

Quadrilaterals

Page 19: a. quadrilateral; b. B; c. A, B, and D; d. C; e. trapezoid; f. No; g. No; h. Yes; i. Yes; j. Yes; k. quadrilateral, parallelogram, rectangle, and square

Page 20: a. adjacent, congruent; b. congruent; c. congruent; d. congruent; e-f. Check drawings; g. 96° ; h. 74° ; i. 17° ; j. 111°

Circles

Page 21: a. center; b. line segment BC; c. line segment OA, line segment OB, or line segment OC; d. central; e. chord; f. vertex; g. minor; h. arc AC, arc AB, or arc BC; i. minor; j. major; k. 10 m; l. diameter; m. semicircle PMN

Page 22: a. O; b. $\angle COD$ or $\angle AOC$; c. chord; d. diameter; e. radius; f. 3; g. 3; h. 1; i. minor; j. major; k. semicircle; l. center; m. 7.2 mm; n. 36 cm; o. 11 feet; p. 5.8 m; q. $\frac{1}{2}$ in

Prisms

Page 23: a. A, C, D, E, F, and H; b. A, D, E, and H; c. A, D, and H; d. 6; e. 2; f. 12; g. 8; h. rectangular prism

Page 24: a. D; b. 8; c. 18; d. 12; e. 6, 12, 8; f. 7, 15, 10; g. 11, 27, 18; h. 14, 36, 24

Pyramids

Page 25: a. quadrilateral; b. lateral face; c. edge; d. apex; e. 5; f. quadrilateral ABCD; g. one; h. triangular; i. 17; j. 10

Page 26: a. pentagon; b. 5; c. 10; d. apex; e. triangle; f. $\triangle ABX$, $\triangle BCX$, $\triangle CDX$, $\triangle DEX$, $\triangle EAX$; g. 4, 6, 4; h. 11, 20, 11; i. 13, 24, 13; j. 21, 40, 21

Cones and Cylinders

Page 27: a. one; b. perpendicular; c. center; d. height; e. apex; f. cylinder; g. rectangle; h. circle or oval; i. height; j. one; k. two

Page 28: a. rectangle; b. circle or oval; c. zero; d. height; e. no; f. Answers will vary.; g. Answers will vary.

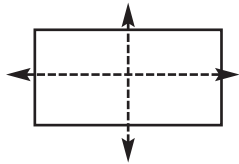
Spheres

Page 29: a. zero; b. one; c. circle; d. center; e. no; f. A sphere is a solid figure (three-dimensional) and a circle is a plane figure (two-dimensional); g. Answers will vary.

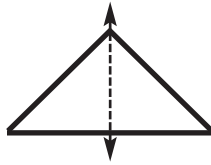
Page 30: a. cube; b. sphere; c. pentagonal pyramid; d. triangular prism; e. parallelogram; f. cone

Line Symmetry

Page 31: a.

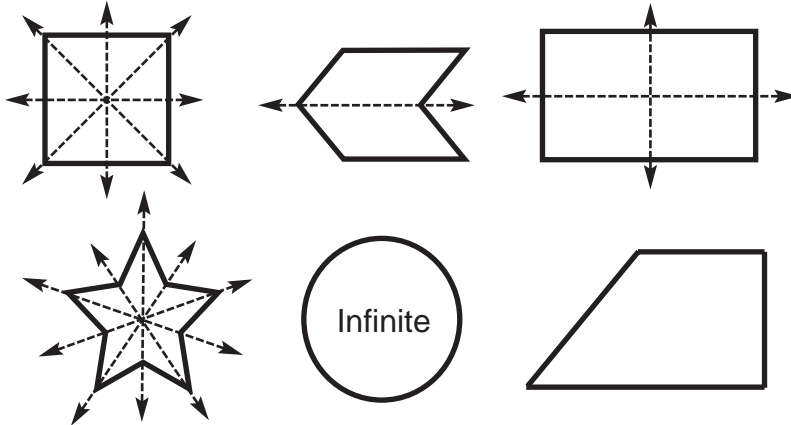


b.



c. Answers will vary.; d. 0, 1, 3, and 8

Page 32:



a. F; b. B; c. C; d. A, D, and E; e. E

Congruence

Page 33: a. line segment XY; b. line segment YZ; c. line segment ZX; d. $\angle X$; e. $\angle Y$; f. $\angle Z$; g. line segment BE; h. line segment EA; i. line segment AR; j. line segment RB; k. $\angle B$; l. $\angle E$; m. $\angle A$; n. $\angle R$

Page 34: a. line segment CO; b. line segment JR; c. $\angle Y$; d. $\angle G$; e. line segment YC; f. line segment NL, 9 cm; g. line segment FE, 16 cm; h. $\angle F$, 60° ; i. $\angle M$, 30°

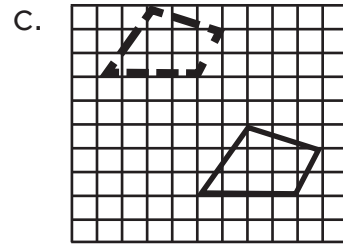
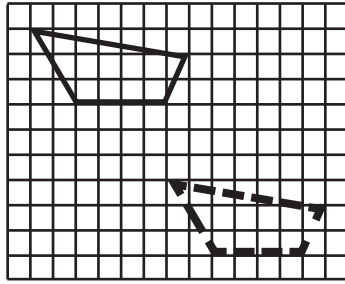
Similarity

Page 35: a. AW BX CY DZ; b. BX; c. length of AB/length of WX = $14/28 = 1/2$, length of BC/length of XY = $20/40 = 1/2$, length of CD/length of YZ = $14/28 = 1/2$; length of DA/length of ZW = $20/40 = 1/2$; d. Yes; e. shape, size

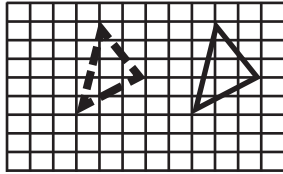
Page 36: a. congruent; b. proportional; c. 36° ; d. 54° ; e. 54° ; f. $20/8 = 5/2$; g. 6; h. 25

Slides (Translations)

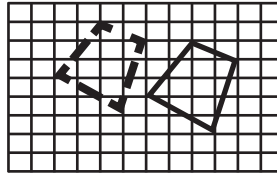
Page 37: a. 1; b.



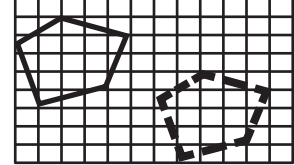
Page 38: a.



b.

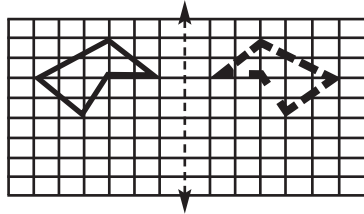


c.

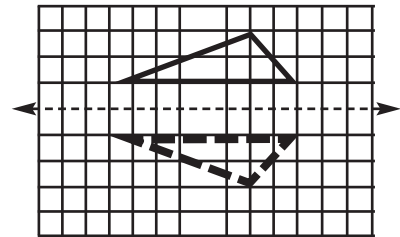


Flips (Reflections)

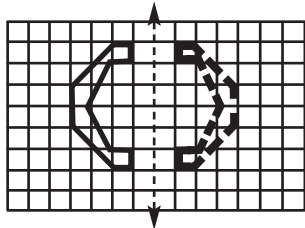
Page 39: a. 3; b.



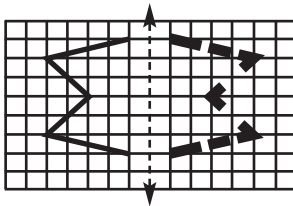
c.



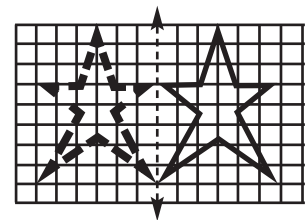
Page 40: a.



b.



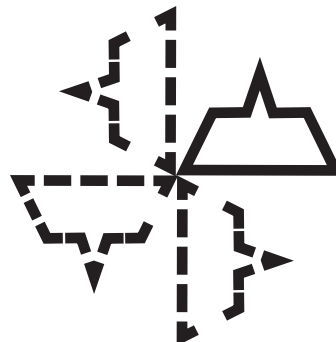
c.



Turns (Rotations)

Page 41: a. 2; b. 1; c. translations (slides), reflections (flips), and rotations (turns); d. 360°; e. turn center or center of rotation

Page 42: a. Check student drawings. b.



Perimeter

Page 43: a. 10.6 cm; b. 20 feet; c. 16.3 units; d. 90 feet; e. 28 in

Page 44: a. 100 units; b. 12 ft; c. 5 in; d. 21.2 m; e. 24 m; f. 3 mm;
g. 12.8 cm; h. 12 ft; i. 6 in; j. 14.7 miles

Area: Rectangles and Squares

Page 45: a. 63 unit²; b. length, width; c. side; d. 40 mm²; e. 54 cm²;
f. 36 in²; g. 5 in; h. 81 cm²; i. 196 in²; j. 8 in

Page 46: a. 132 units²; b. 132 units²; c. 75 units²

Area: Parallelograms

Page 47: a. base, height; b. 112 units²; c. 100 units²;
d. 72 units²; e. 18,000 units²

Page 48: a. 1.28 mm²; b. 90 in²; c. 340 m²; d. 28 cm²; e. 3/8 in²;
f. 744 ft²; g. 9 in; h. 4 in

Area: Triangles

Page 49: a. a parallelogram; b. half; c. 1/2, base, height;
d. perpendicular, base, vertex; e. 200 units²; f. 620 units²

Page 50: a. 35 units²; b. 52.9 ft²; c. 66 m²; d. 4.8 cm²; e. 3/16 in²;
f. 600 ft²; g. 6 in; h. 20 in

Circle Measurements

Page 51: a. perimeter; b. pi, or π ; c. πd ; d. πr^2 ; e. \approx ; f. 132 ft;
g. 1,386 ft²

Page 52: a. 66 m, 346 1/2 m²; b. 22 m, 38 1/2 m²; c. 12.56 ft,
12.56 ft²; d. 94.2 ft; e. 706.5 ft²

Nets and Surface Area

Page 53: a. 126 units²; b. 678 in²; c. 600 cm²

Page 54: a. 836 in²; b. 216 units²

Volume: Prisms

Page 55: a. space; b. cubic c. length, width, height; d. base area, height; e. 90 unit^3 ; f. 27 ft^3 ; g. 264 in^3

Page 56: a. 240 in^3 ; b. 343 cm^3 ; c. 100 in^3 ; d. $4,320 \text{ ft}^3$

Volume: Cylinders and Cones

Page 57: a. prism; b. base area, height; c. 785 cm^3 ; d. 9.42 in^3 ; e. 60 in^3

Page 58: a. $1/3$; b. 141.3 in^3 ; c. 50.24 cm^2 , 401.92 cm^3 ; d. 50.24 cm^2 , 133.97 cm^3 ; e. 113.04 mm^2 , $1,356.48 \text{ mm}^3$ f. 113.04 mm^2 , 452.16 mm^3 ; g. 254.34 in^2 , $2,543.4 \text{ in}^3$; h. 254.34 in^2 , 847.8 in^3