**3.1 Parallel Lines and Transversals**

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| **Standards**8.G.5 | **Learning Objectives (I can…)*** Identify the angles formed when parallel lines are cut by a transversal.
* Find the measures of angles formed when parallel lines are cut by a transversal.
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Lines in the same plane that do not \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lines.

Lines that intersect at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lines.



A line that intersects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lines is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When parallel lines are cut by a transversal, several pairs of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles are formed.

**Key Idea**

**Corresponding Angles**

When a transversal intersects parallel lines, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles are congruent.



**Example 1:** Finding Angle Measures





**On Your Own: Use the figure to find the measure of the angle. Explain your reasoning.**



**Example 2:** Using Corresponding Angles

**Use the figure to find the measures of the numbered angles.**



**On Your Own:**



When two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are cut by a transversal, \_\_\_\_\_\_\_\_\_\_\_\_ interior angles are formed on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the parallel lines and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ exterior angles are formed on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the parallel lines.



**Example 3:** Using Corresponding Angles





**On Your Own:**



**Key Idea**

**Alternate Interior Angles and Alternate Exterior Angles**

When a transversal intersects parallel lines, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are congruent and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are congruent.



**Example 4:** Identifying Alternate Interior and Alternate Exterior Angles

**The photo shows a portion of an airport. Describe the relationship between each pair of angles.**







**On Your Own:**







**3.2 Angles of Triangles**

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| --- | --- |
| **Standards**8.G.5 | **Learning Objectives (I can…)*** Understand that the sum of the interior angle measures of a triangle is 180 degrees.
* Find the measure of the interior and exterior angles of a triangle.
 |

The angles inside a polygon are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When the sides of a polygon are extended, other angles are formed. The angles outside the polygon that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the interior angles are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Key Idea**

**Interior Angle Measures of a Triangle**

The sum of the interior angle measures of a triangle is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

x + y + z = \_\_\_\_\_\_\_\_\_\_

**Example 1:** Using Interior Angle Measures

**Find the value of x.**

1.  **b)**

**On Your Own: Find the value of x.**

1.  2. 

**Key Idea**

**Exterior Angle Measures of a Triangle**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of an exterior angle of a triangle is equal to the \_\_\_\_\_\_\_\_\_\_\_\_\_ of the measures of the two nonadjacent \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles.



\_\_\_\_\_\_\_\_\_\_ = x + y

**Example 2:** Finding Exterior Angle Measures

**Find the measure of the exterior angle.**

1. 

**Example 3:** Real-Life Application





**On Your Own: Find the measure of the exterior angle.**



**3.3 Angles of Polygons**

|  |  |
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| **Standards**8.G.5 | **Learning Objectives (I can…)*** Find the sum of the interior angles measures of a polygon.
* Understand that the sum of the exterior angle measures of a polygon is 360 degrees.
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A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a closed plane figure made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ line segments that intersect only at their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



**Key Idea**

**Interior Angle Measures of a Polygon**

The sum S of the interior angle measures of a polygon with n sides is:

**Example 1:** Finding the Sum of the Interior Angle Measures

**Find the sum of the interior angle measures of the school crossing sign.**



**On Your Own: Find the sum of the interior angle measures of the green polygon.**

1. 2. 

**Example 2:** Finding an Interior Measure of a Polygon

**Find the value of x.**



**On Your Own: Find the value of x.**



In a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ polygon, all the sides are\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and all the interior angles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Example 3:** Real-Life Application

**A cloud system discovered on Saturn is in the approximate shape of a regular hexagon. Find the measure of each interior angle of the hexagon.**

**On Your Own: Find the measure of each interior angle of the regular polygon.**



**Key Idea**

**Exterior Angle Measures of a Polygon**

The sum of the measures of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles of a convex polygon is \_\_\_\_\_\_\_\_\_.



w + x + y + z = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Example 4:** Finding Exterior Angle Measures

**Find the measures of the exterior angles of each polygon.**

1.  **b.** 

**3.4 Using Similar Triangles**

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| --- | --- |
| **Standards**8.G.5 | **Learning Objectives (I can…)*** Understand the concept of similar triangles.
* Identify similar triangles.
 |

**Key Idea**

**Angles of Similar Triangles**

When \_\_\_\_\_\_\_\_\_\_ angles in one triangle are \_\_\_\_\_\_\_\_\_\_\_\_ to two angles in another triangle, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles are also congruent and the triangles are similar.



Triangle ABC is similar to Triangle DEF : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Example 1:** Identifying Similar Triangles

**Tell whether the triangles are similar. Explain.**

1. 
2. 



**On Your Own: Tell whether the triangles are similar. Explain.**



Indirect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ uses similar figures to find a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ measure when it is difficult to find directly.

**Example 2:** Using Indirect Measurement

**You plan to cross a river and want to know how far it is to the other side. You take measurements on your side of the river and make the drawing shown. (a) Explain why △ABC and △DEC are similar. (b) What is the distance x across the river?**



**On Your Own:**

