# Angle Pairs

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Here you'll learn to identify angle pairs as supplementary, complementary or neither.

Remember the trip to the art museum? Well, in the last Concept, you practiced identifying different types of angles in the stained glass. Now the students are going to need to identify angle pairs. These angle pairs can also be found in the stained glass. Here is the stained glass once again.



In this Concept, you will learn all about angle pairs. Pay close attention and you will be able to find these pairs at the end of the Concept.

# Guidance

When we have two angles together, we can say that we have *angle pairs*. Sometimes, **the measures of these angles add up to form a special relationship.** Sometimes they don't. There are two special angle pair relationships for you to learn about. The first one is called *complementary angles* and the second one is called *supplementary angles*.

*Complementary angles* are two angles whose measurements add up to exactly  $90^{\circ}$ . In other words, when we put them together they make a right angle. Below are some pairs of complementary angles.



*Supplementary angles* are two angles whose measurements add up to exactly 180°. When we put them together, they form a straight angle. Take a look at the pairs of supplementary angles below.

# Supplementary angles



Let's practice classifying some pairs of angles.

Classify the following pairs of angles as either complementary or supplementary.



The sum of the angles in Figure 1 is 180°. Therefore these angles are supplementary angles.

# The sum of the angles in Figure 2 is $90^{\circ}$ . Therefore these angles are complementary angles.

Remember, complementary angles add up to  $90^{\circ}$  and supplementary angles add up to  $180^{\circ}$ . In order to classify the pairs as complementary or supplementary, we need to add the measures of the angles in each pair together to find out the total.

Now it's your turn to try a few. Identify the angle pairs as complementary, supplementary or neither.

# Example A

Angle  $A = 23^{\circ}$ , Angle  $B = 45^{\circ}$ 

Solution: Neither

# Example B

Angle  $A = 45^{\circ}$ , Angle  $B = 45^{\circ}$ 

# Solution: Complementary

# Example C

Angle  $A = 103^{\circ}$ , Angle  $B = 77^{\circ}$ 

## **Solution: Supplementary**

Now that you have learned about angle pairs. Look at the stained glass once again.



Write down or draw a copy of the stained glass in your notebook. Then identify the angle pairs that you can find. When you have done this, discuss your findings with a friend.

## Vocabulary

Here are the vocabulary words in this Concept.

#### **Acute Angle**

an angle whose measure is less than  $90^\circ$ 

#### **Obtuse Angle**

an angle whose measure is greater than  $90^{\circ}$ 

### **Right Angle**

an angle whose measure is equal to  $90^{\circ}$ 

#### **Straight Angle**

an angle whose measure is equal to  $180^{\circ}$ 

#### Degrees

how an angle is measured

## **Angle Pairs**

when the measures of two angles are added together to form a special relationship

## **Supplementary Angles**

angle pairs whose sum is  $180^\circ$ 

## **Complementary Angles**

angle pairs whose sum is 90°

## **Guided Practice**

Here is one for you to try on your own.

Are angles X and Y complementary or supplementary?



#### Answer

The question asks us to classify angles *X* and *Y* as either complementary or supplementary. Look at the figure. This time we do not know the measures of any of the angles. **Can we still answer the question?** 

We can. We know that complementary angles add up to  $90^{\circ}$  and supplementary angles add up to  $180^{\circ}$ . We also know that  $90^{\circ}$  is a right angle and that  $180^{\circ}$  is a straight angle. Now take a good look at angles *X* and *Y*. If we put them together as a whole, do they form a right angle or a straight angle? They form a straight angle, so they must be supplementary.

## **Video Review**

Here is a video for review.





- This is a James Sousa video onthetypes of angles.

# **Practice**

Directions: Identify whether the pairs below are complementary or supplementary or neither.

1.



2.



3.



4. An angle pair whose sum is  $180^{\circ}$ 

5. Angle 
$$A = 90^{\circ}$$
 Angle *B* is  $45^{\circ}$ 

- 6. Angle  $C = 125^{\circ}$  Angle  $B = 55^{\circ}$
- 7. An angle pair whose sum is  $180^{\circ}$
- 8. An angle pair whose sum is  $245^{\circ}$
- 9. An angle pair whose sum is  $80^{\circ}$
- 10. An angle pair whose sum is  $90^{\circ}$
- 11. An angle pair whose sum is  $55^{\circ}$
- 12. An angle pair whose sum is  $120^{\circ}$
- 13. An angle pair whose sum is  $95^{\circ}$
- 14. An angle pair whose sum is  $201^{\circ}$
- 15. An angle pair whose sum is  $190^{\circ}$