# Learn About

Using Geometry: Parallel Lines and Transversals

Parallel lines do not intersect. A **transversal** is a line that intersects two or more lines at different points. A **straight line** has a measure of 180°. **Supplementary** angles are two angles whose measures have a sum of 180°. **Corresponding** angles of the intersections of two parallel lines have equal measures. **Vertical angles** are opposite angles and have equal measures.

Lines l and m are parallel and are intersected by line b, which is a transversal.
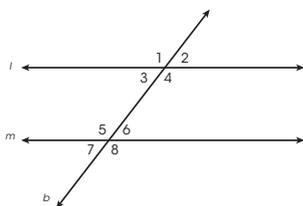
Supplementary Angles		Corresponding Angles	Vertical Angles
∠1 and ∠2	∠1 and ∠3	∠1 and ∠5	∠1 and ∠4
∠3 and ∠4	∠2 and ∠4	∠3 and ∠7	∠2 and ∠3
∠5 and ∠6	∠5 and ∠7	∠2 and ∠6	∠5 and ∠8
∠7 and ∠8	∠6 and ∠8	∠4 and ∠8	∠6 and ∠7

Look at the diagram. Then determine the measure of ∠x.

Jackson is studying parallel lines and transversals. His teacher gave him this diagram. Lines b and c are parallel and are cut by transversal a. What is the measure of ∠x?
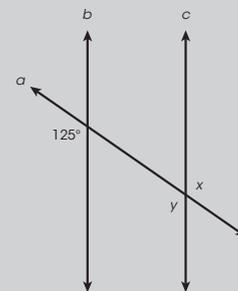
In the diagram, ∠y and the angle labelled 125° are corresponding angles. So, they have equal measures and ∠y measures 125°.

Because ∠x and ∠y are vertical angles, their measures are equal. The measure of ∠x is **125°**.

Remember:

A **straight line** has a measure of 180°. **Supplementary** angles are two angles whose measures have a sum of 180°. **Corresponding** angles of the intersections of two parallel lines have equal measures. **Vertical** angles are opposite angles and have equal measures.

1. What is the measure of ∠*x*?

Ⓐ 180°

This answer is not correct because 180° is the measure of a straight angle or straight line. ∠x is not a straight angle.

Ⓑ 140°

This answer is not correct because ∠x and the angle labeled 140° are not corresponding angles. ∠x corresponds to the angle that is supplementary to the angle labeled 140°, therefore they are supplemental angles and are not congruent.

Ⓒ 90°

This answer is not correct because ∠x is a supplementary angle to the corresponding angle of the angle that measures 140°. The measure of ∠x is 180° − 140° = 40°, not 90°.

● 40°

This answer is correct because ∠x is a supplementary angle to the corresponding angle of the angle that measures 140°. The measure of ∠x is 180° − 140° = 40°.

2. What is the area of figure *HOUSE*?

Ⓐ 230 square metres

This answer is not correct because the area of figure HOUSE is the sum of the areas of the square, rectangle and triangle. $1600 + 400 + 600 = 2600 \text{ m}^2$.

● 2600 square metres

This answer is correct because the area of figure HOUSE is the sum of the areas of the square, rectangle and triangle. $1600 + 400 + 600 = 2600 \text{ m}^2$.

Ⓒ 2800 square metres

This answer is not correct because the area of figure HOUSE is the sum of the areas of the square, rectangle and triangle. $1600 + 400 + 600 = 2600 \text{ m}^2$.

Ⓓ 3200 square metres

This answer is not correct because the area of figure HOUSE is the sum of the areas of the square, rectangle and triangle. $1600 + 400 + 600 = 2600 \text{ m}^2$.

Lesson **3**

Read the passage.
Then do Numbers 1–5.

Finding the Right Container

Thomas has made about 2450 cubic centimetres of fruit punch. He has several different containers, all of different volumes. Thomas needs to find a single container to hold all of the punch until tomorrow. He does not remember the volume of the available containers, so he must measure each one to determine which will hold the punch.

1. Thomas first measures a cylindrical container. The diameter of the container is 12 centimetres and the height is 18 centimetres. What is the volume of this container?

Ⓐ 678.58 cubic centimetres

Ⓑ 2034.72 cubic centimetres

Ⓒ 4069.44 cubic centimetres

Ⓓ 8138.88 cubic centimetres

2. Thomas has another cylindrical container with a volume of 1727 cubic centimetres and a height of 22 centimetres. What is the diameter of this container?

Ⓐ 25 centimetres

Ⓑ 10 centimetres

Ⓒ 8 centimetres

Ⓓ 5 centimetres

Lesson 15

**Read the passage.
Then do Numbers 1–5.**

Window Worries

Rob just purchased a house that has some unique windows. The house is old, and some of the broken windows must be replaced. The house has some triangular, octagonal and hexagonal windows as well as a window shaped like a rhombus. Because of the unusual shapes, the angle measures must be determined in addition to the other usual measurements.
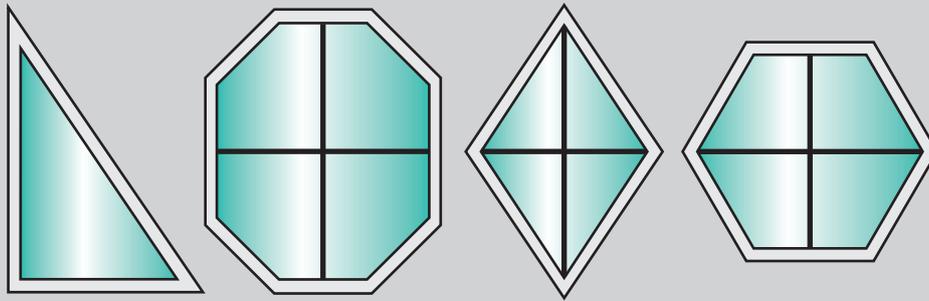
1. One triangular window has a right angle. One of the acute angles measures 35°. What is the measure of the third angle?

   Ⓐ 55°
   Ⓑ 65°
   Ⓒ 75°
   Ⓓ 145°

2. There are four congruent rhombus-shaped windows along a wall in another room. In each rhombus, the two smaller congruent angles measure 78° each. What is the measure of each of the larger angles?

   Ⓐ 12°
   Ⓑ 78°
   Ⓒ 102°
   Ⓓ 282°

Self-Assessment 2
Lessons 6-10

FOCUS on Using Geometry, Book H

Name _____ Date _____

1. Rate your work in Lessons 6–10. Circle your answer.

   successful   somewhat successful   needs improvement

2. Did any of the questions give you trouble? _____
   If so, what kind of trouble did you have?

   _____

   _____

   Is this the same kind of trouble you had in Lessons 1–5? _____

3. Did you find the questions easier or more difficult than those in Lessons 1–5?

   _____

   Why do you think this is so?

   _____

   _____

4. Did you meet the goal you set for yourself for Lessons 6–10? _____
   Why or why not?

   _____

   _____

5. What is your goal for Lessons 11–15?

   _____

   _____