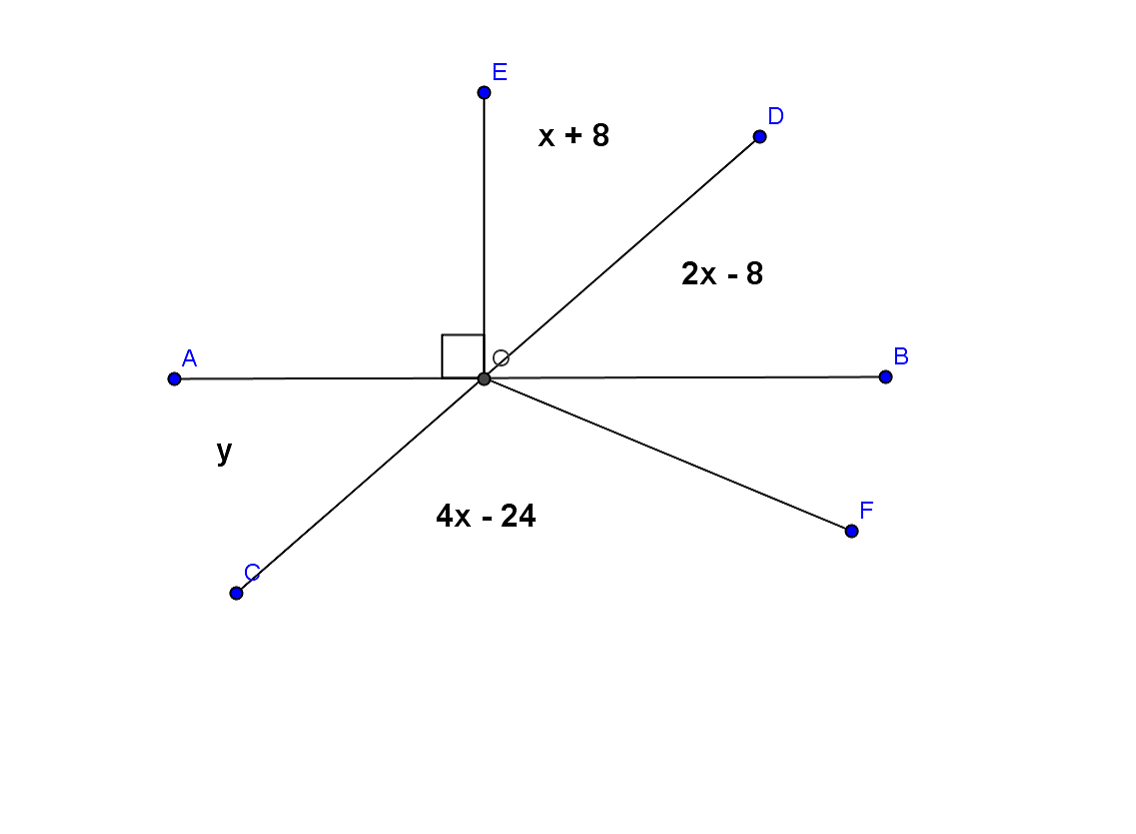
Lesson 7: Solve for Unknown Angles—Transversals

Classwork

Opening Exercise

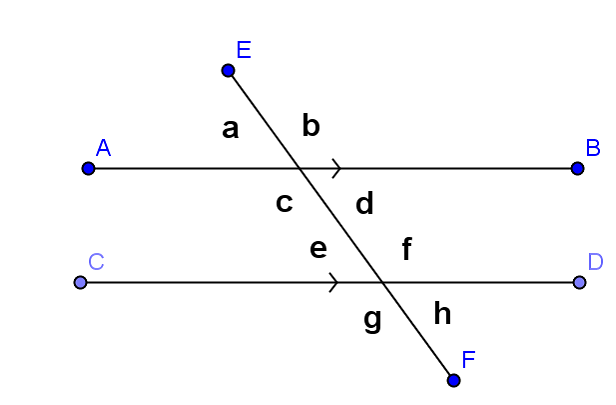
Use the diagram at the right to determine and . and are straight lines.

Name a pair of vertical angles:

Find the measure of . Justify your calculation.

Discussion

Given line and line in a plane (see the diagram below), a third line is called a *transversal* if it intersects at a single point and intersects at a single but different point. Line and line are parallel if and only if the following types of angle pairs are congruent or supplementary.

* Corresponding angles are equal in measure

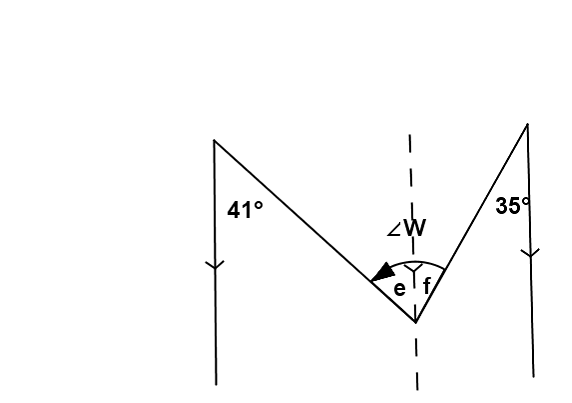
* Alternate interior angles are equal in measure

* Same side interior angles are supplementary

**Examples**

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|  |  |
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1. An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is sometimes useful when solving for unknown angles.

In this figure, we can use the auxiliary line to find the measures of and (how?), then add the two measures together to find the measure of .

What is the measure of ?

Exercises

In each exercise below, find the unknown (labeled) angles. Give reasons for your solutions.

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Relevant Vocabulary

**Alternate Interior Angles:**  Let line be a transversal to lines and such that intersects at point and intersects at point . Let be a point on line and be a point on line such that the points and lie in opposite half-planes of . Then and are called *alternate interior angles* of the transversal with respect to line and line .

**Corresponding Angles*:*** Let line be a transversal to lines and .If and are alternate interior angles, and and are vertical angles, then and are *corresponding angles*.

Problem Set

Find the unknown (labeled) angles. Give reasons for your solutions.

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