

7.1

Adjacent and Vertical Angles

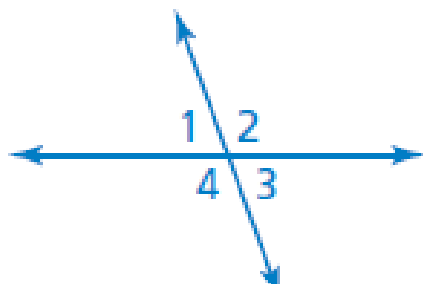


Key Ideas

Adjacent Angles

Words Two angles are **adjacent angles** when they share a common side and have the same vertex.

Examples



$\angle 1$ and $\angle 2$ are adjacent.

$\angle 2$ and $\angle 4$ are not adjacent.

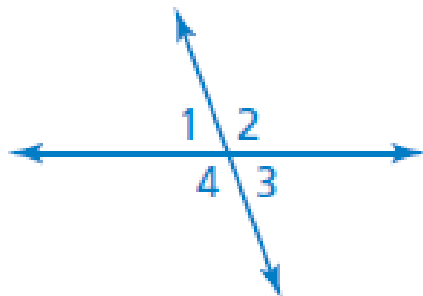


Key Ideas

Adjacent Angles

Words Two angles are **adjacent angles** when they share a common side and have the same vertex.

Examples



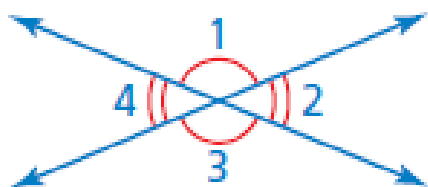
$\angle 1$ and $\angle 2$ are adjacent.

$\angle 2$ and $\angle 4$ are not adjacent.

Vertical Angles

Words Two angles are **vertical angles** when they are opposite angles formed by the intersection of two lines. Vertical angles are **congruent angles**, meaning they have the same measure.

Examples

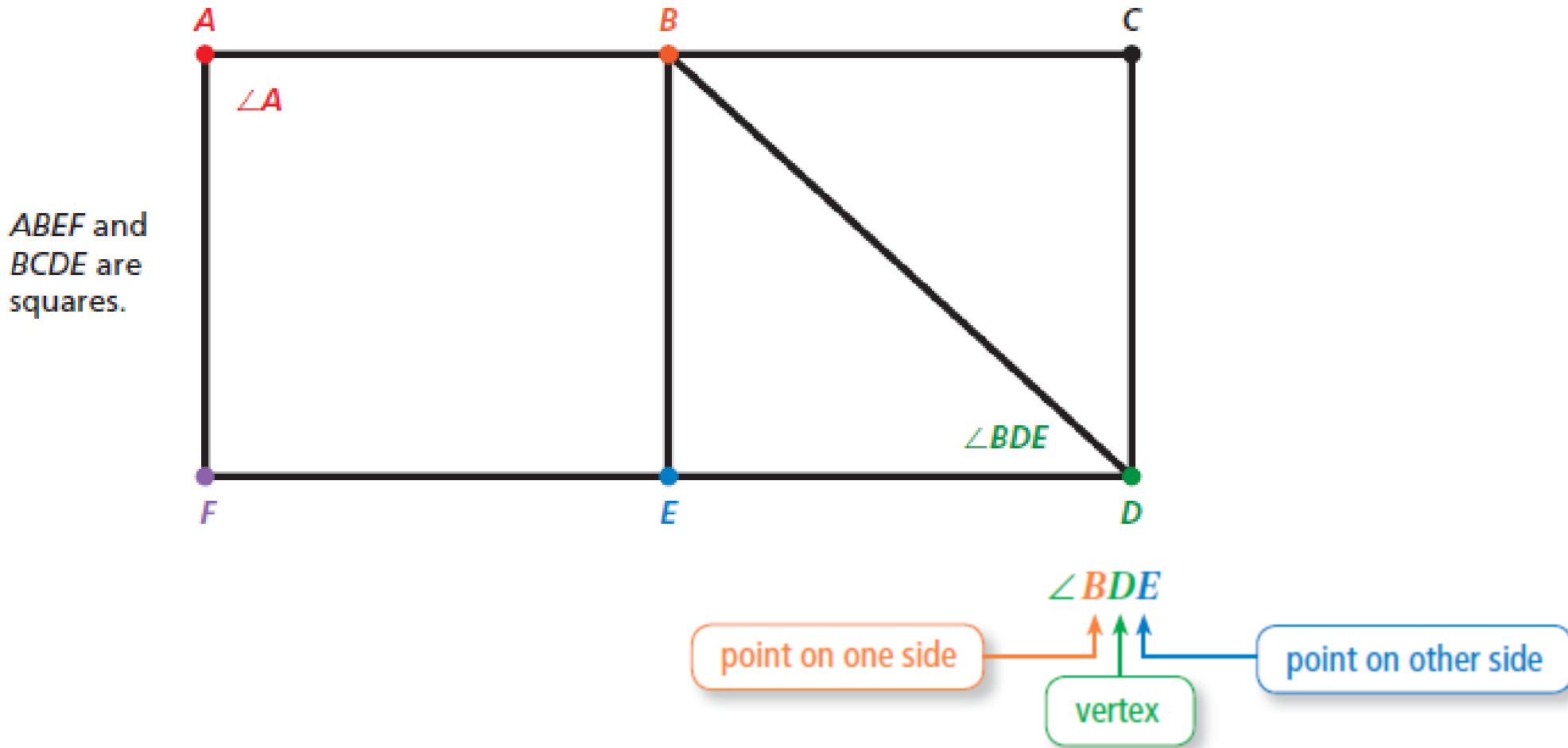


$\angle 1$ and $\angle 3$ are vertical angles.

$\angle 2$ and $\angle 4$ are vertical angles.

Naming Angles

Some angles, such as $\angle A$, can be named by a single letter. When this does not clearly identify an angle, you should use three letters as shown.



EXAMPLE**1****Naming Angles**

Use the figure shown.

a. Name a pair of adjacent angles.

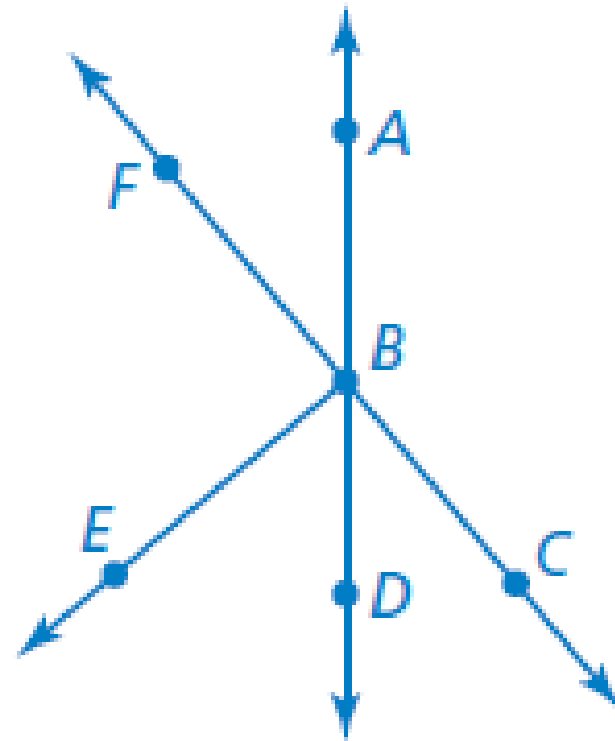
$\angle ABC$ and $\angle ABF$ share a common side and have the same vertex B .

∴ So, $\angle ABC$ and $\angle ABF$ are adjacent angles.

b. Name a pair of vertical angles.

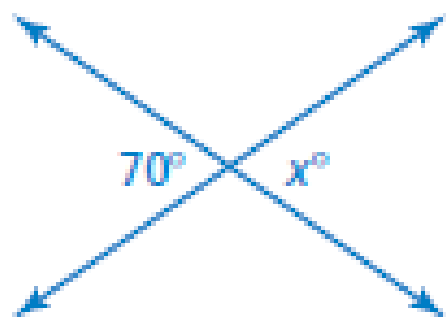
$\angle ABF$ and $\angle CBD$ are opposite angles formed by the intersection of two lines.

∴ So, $\angle ABF$ and $\angle CBD$ are vertical angles.



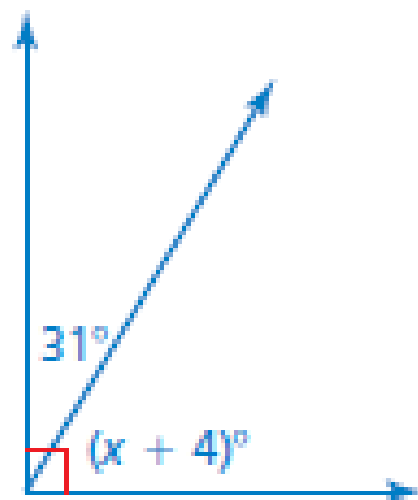
EXAMPLE**2****Using Adjacent and Vertical Angles**

Tell whether the angles are *adjacent* or *vertical*. Then find the value of x .

a.

The angles are vertical angles.
Because vertical angles are congruent,
the angles have the same measure.

❖ So, the value of x is 70.

b.

The angles are adjacent angles.
Because the angles make up a right
angle, the sum of their measures is 90° .

$$(x + 4) + 31 = 90 \quad \text{Write equation.}$$

$$x + 35 = 90 \quad \text{Combine like terms.}$$

$$x = 55 \quad \text{Subtract 35 from each side.}$$

❖ So, the value of x is 55.