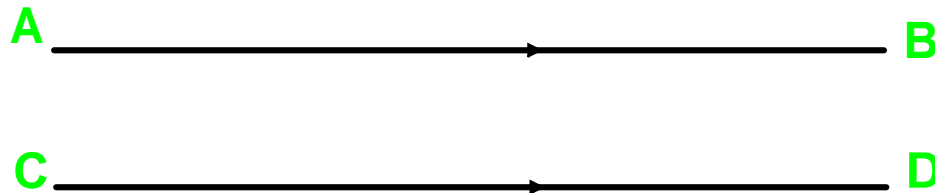# Parallel Lines

If two lines are in the same *plane* and do not intersect, then the lines are said to be **parallel**.

A ————————————————→———————————— B

C ————————————————→———————————— D

For example, **AB** is parallel to **CD** and we write it as **AB** ‖ **CD**.
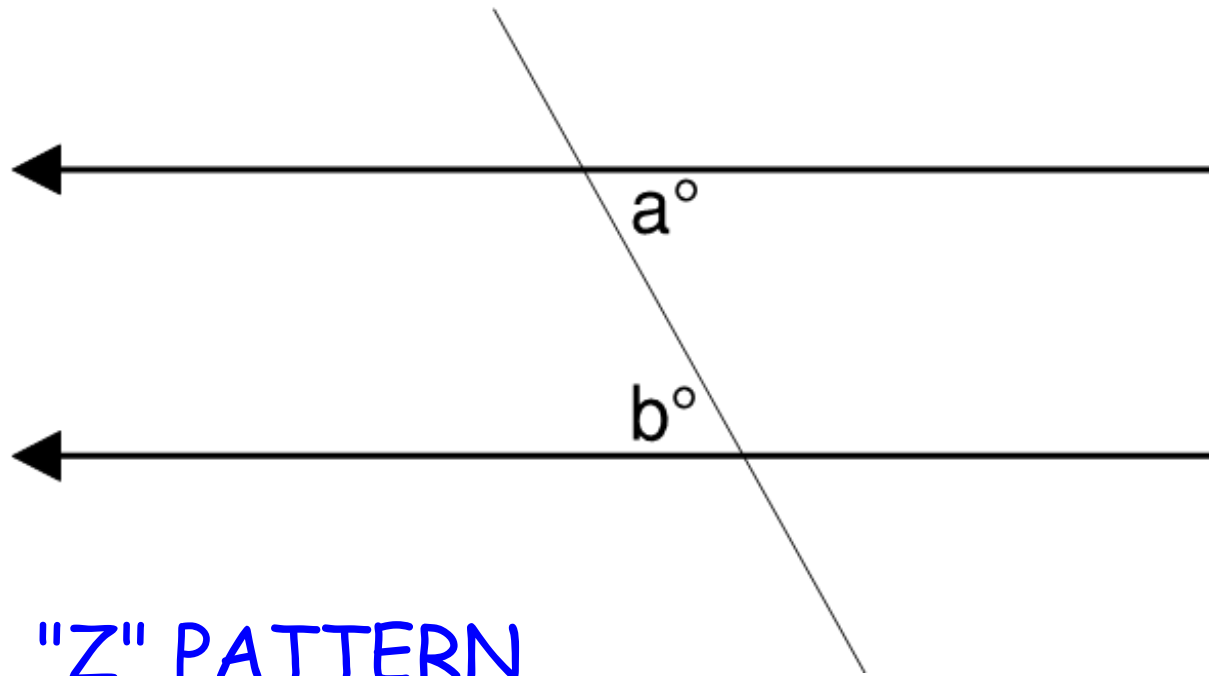
A line that meets two or more parallel lines is called a _transversal_.

Line PQRS in the following diagram is a _transversal_.
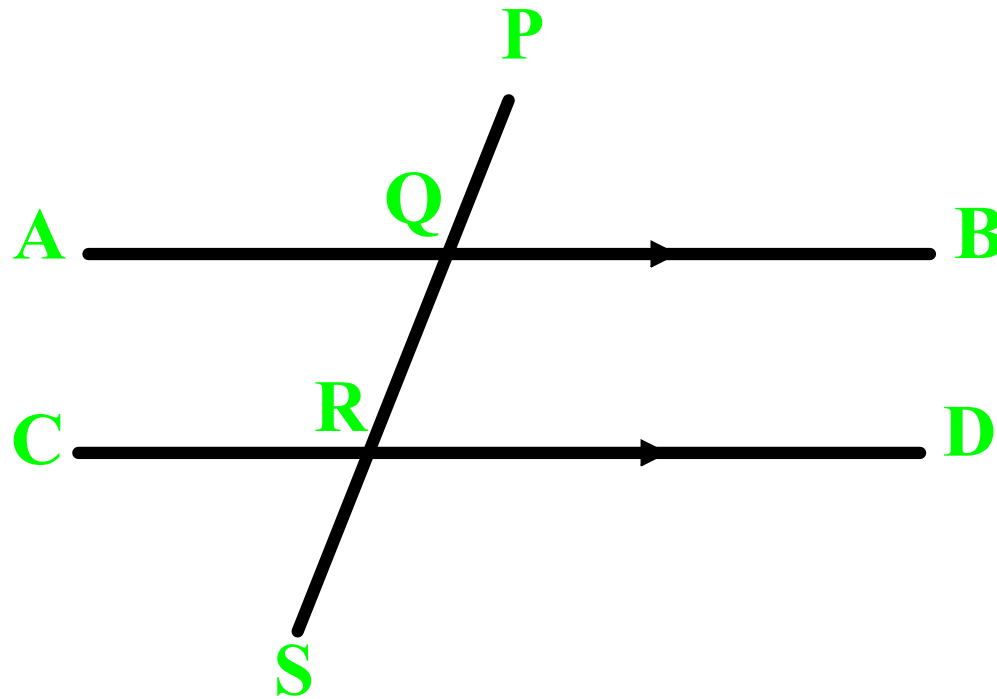
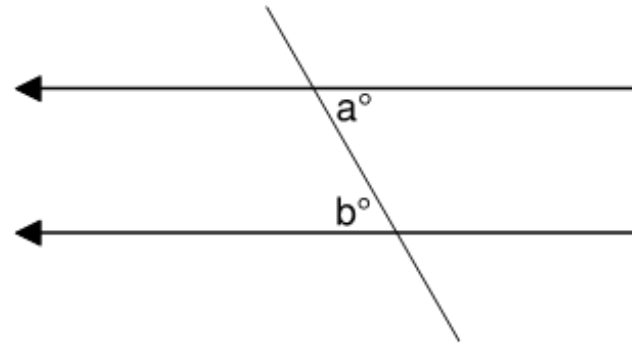⭐ **Alternate Angles are EQUAL**

alternate angles

$a°$

$b°$

"Z" PATTERN

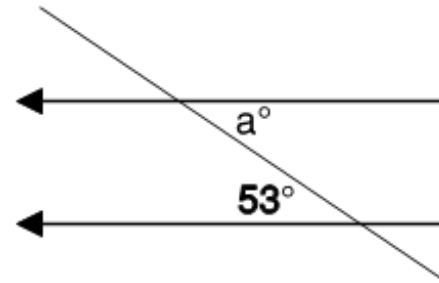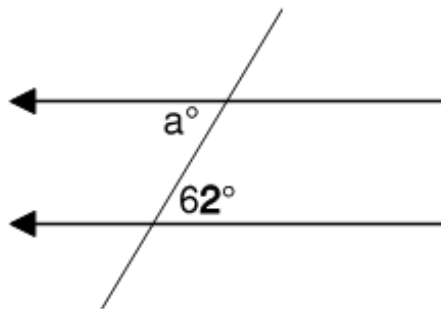$\angle$ a° and $\angle$ b° are called *alternate angles*.
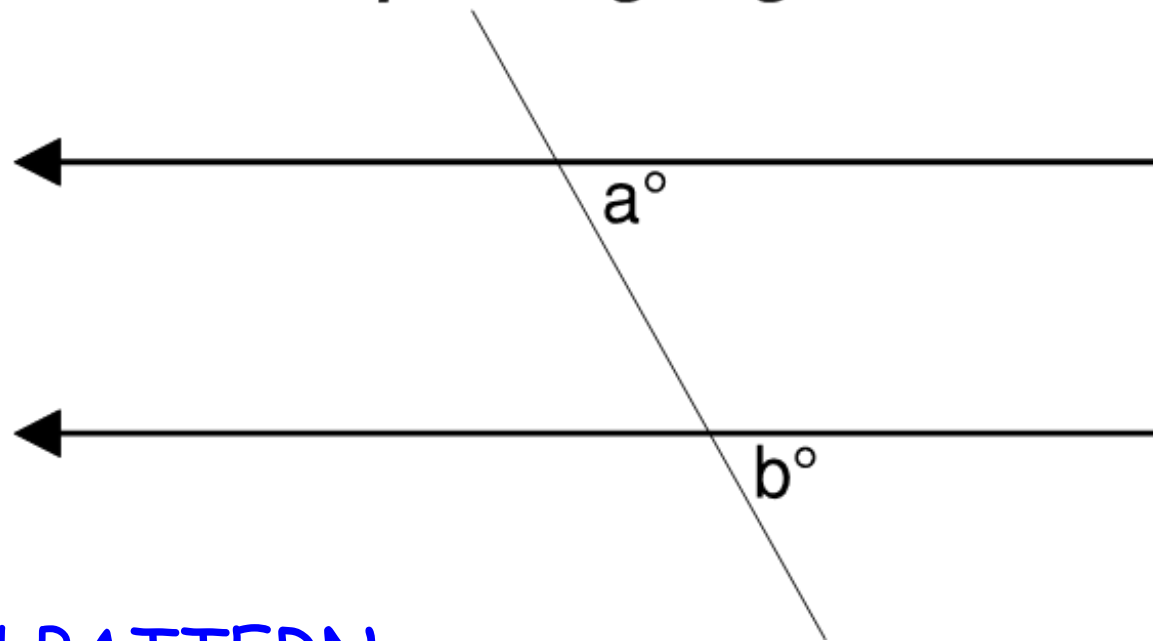They are equal angles.
a° = b°

Now calculate the marked alternate angles.

⭐ **Corresponding Angles are EQUAL**

corresponding angles

a°

b°
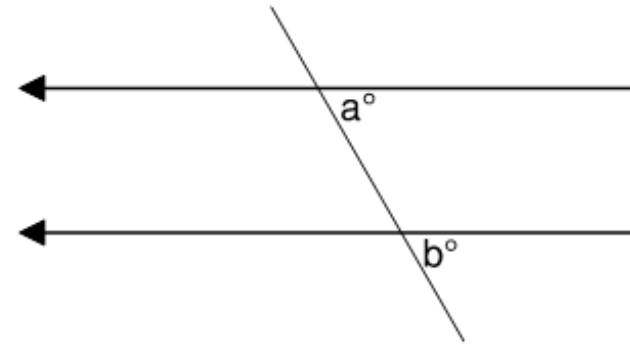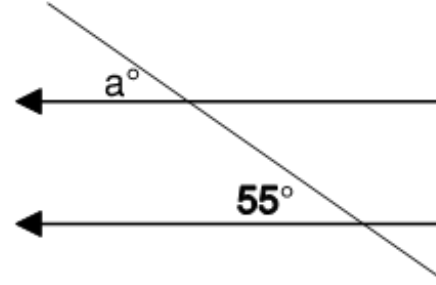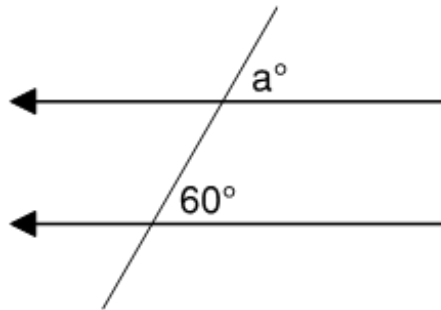
"F" PATTERN

Angles and lines 2

∠ a° and ∠ b° are called **corresponding angles.**
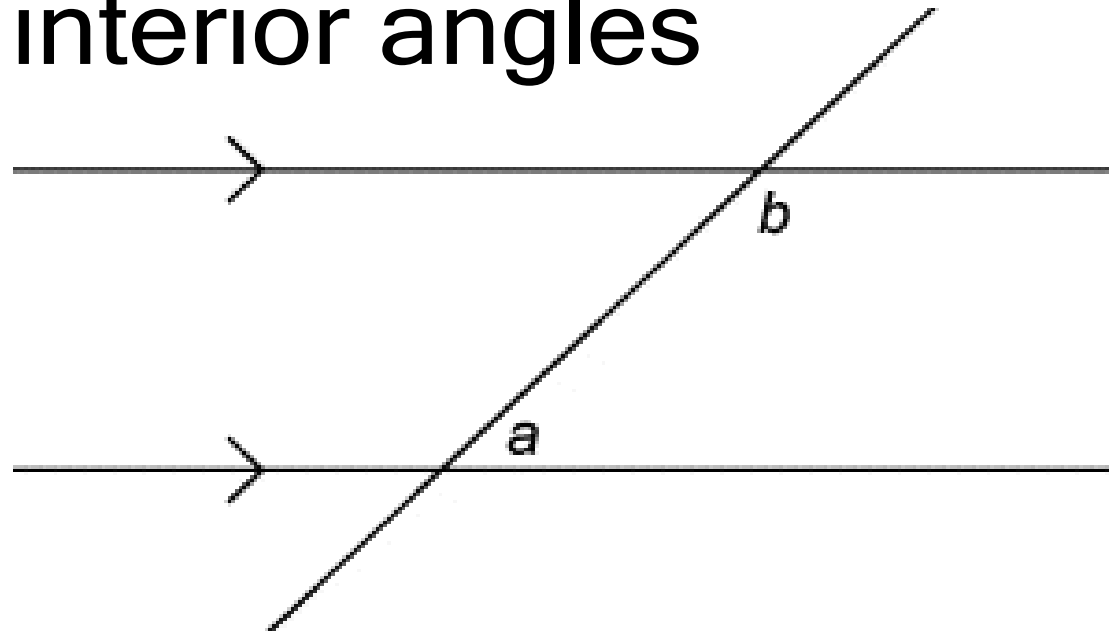They are equal angles.

a° = b°

Now calculate the marked corresponding angles.

⭐ **Interior Angles on the same side of the transversal are SUPPLEMENTARY**
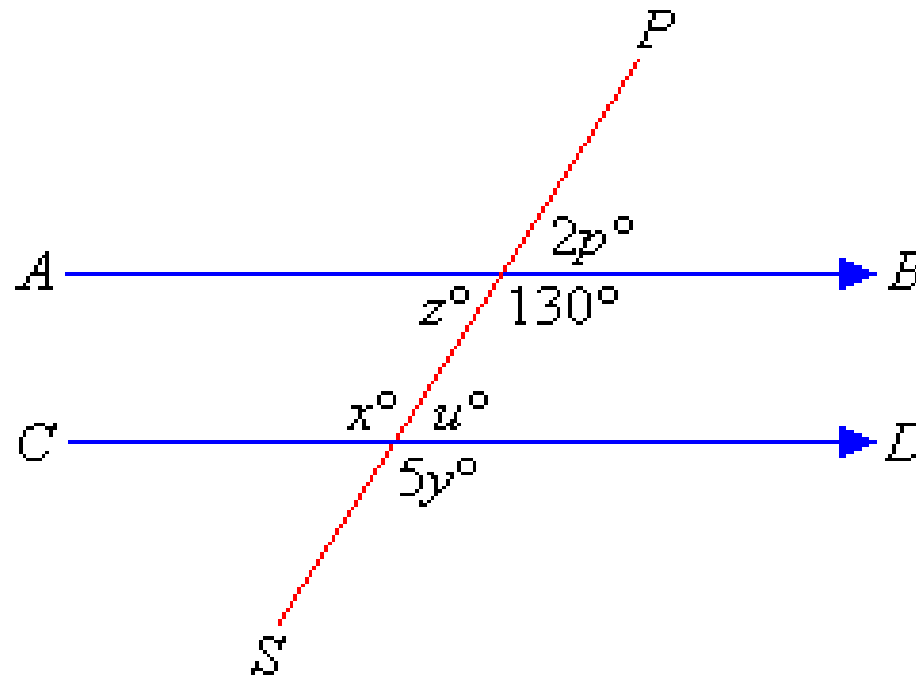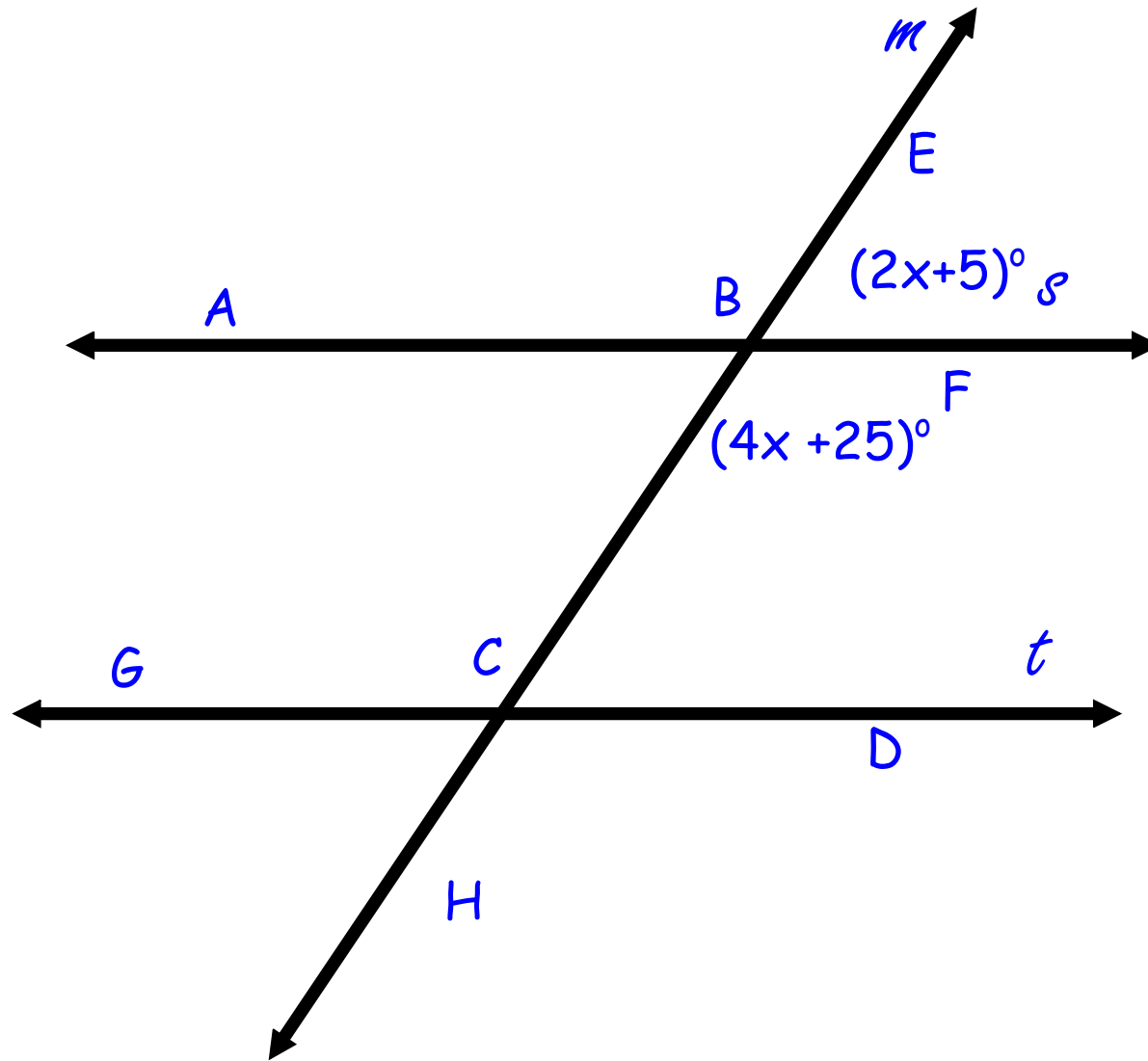
interior angles

"C" PATTERN

Example 1: Use the information given in the diagram to find:
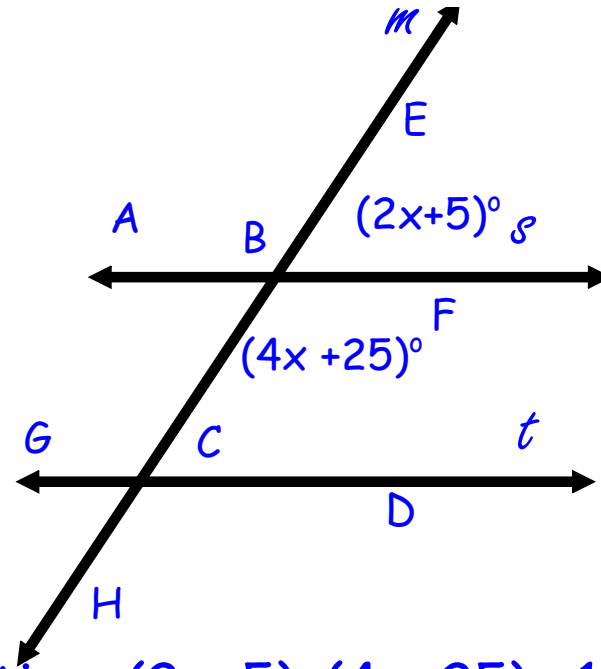
a. x
b. y
c. z
d. u
e. p

Example 2: In this figure s||t, and m is the transversal. Find the measure of <EBF.

m

E

B $(2x+5)°$ s

A

F

$(4x+25)°$

G   C   t

D

H

Solution: The angles are supplementary.

m

E

A   B $(2x+5)°$ s

F

$(4x+25)°$

G   C   t

D

H

Write the equation, $(2x+5)+(4x+25) = 180$.

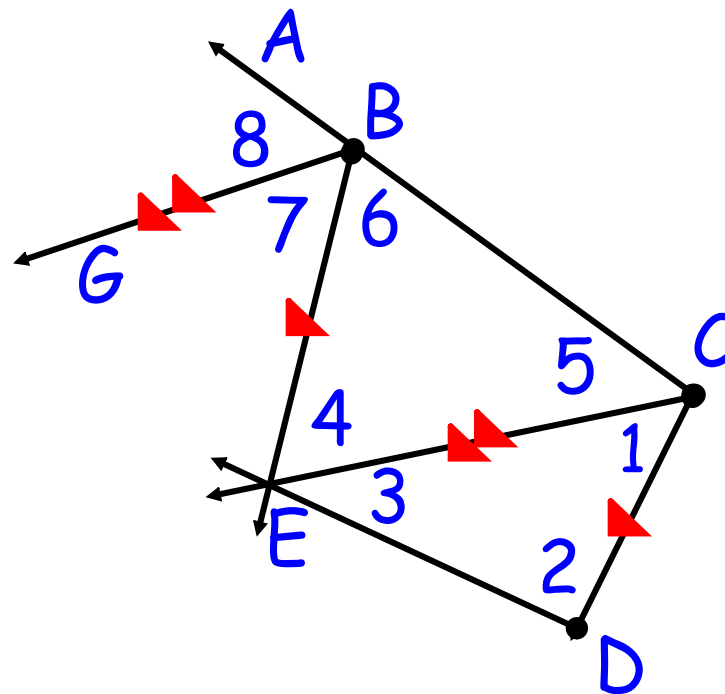Combine like terms, $6x+30=180$

subtract 30 from both sides, $6x=150$

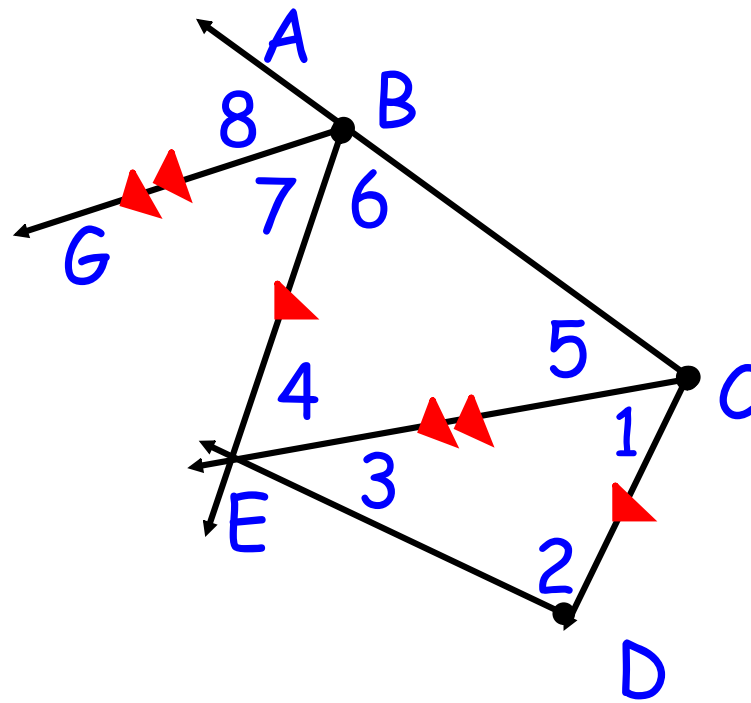divide by 6, $x = 25$

Find the measure of <EBF.

$2(25) +5 = 55°$

Example 3: BG bisects <EBA, & m<8 = 42°, & m<3 = 18°. Find the missing measures of the angles.

▲ tells you they are parallel

1.
2.
3. 18°
4.
5.
6.
7.
8. 42°

Solution: BG bisects <EBA, & m<8 = 42°, & m<3 = 18°. Find the missing measures of the angles.

1. 42°
2. 120°
3. 18°
4. 42°
5. 42°
6. 96°
7. 42°
8. 42°