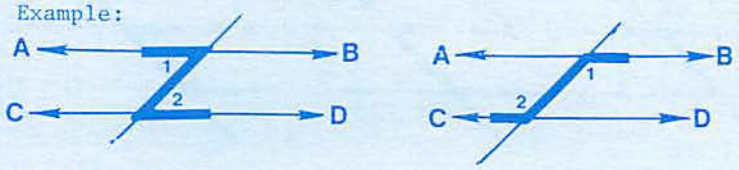
Alternating Interior Angles

REMEMBER

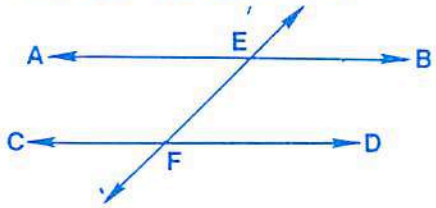
Alternating interior angles formed by a transversal and parallel lines are equal. When traced, they look like a Z or ⌐.

Example:

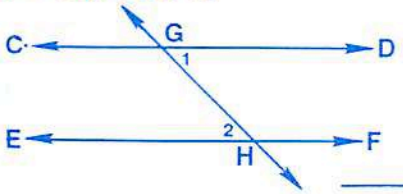


If line AB ∥ CD, then in both cases above ∠1 & ∠2 are alternating interior angles and are equal.

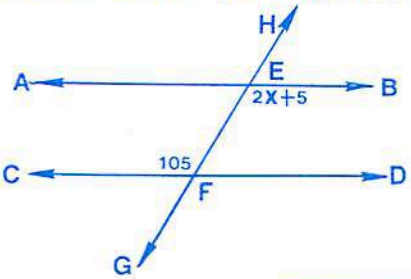
1. In the diagram below, m ∠CFE = 5x and m ∠BEF = x + 20. If AB ∥ CD, find the value of x.



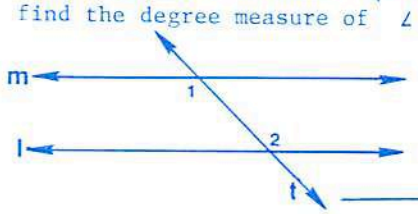
2. As shown in the accompanying diagram, $\overleftrightarrow{CD} \parallel \overleftrightarrow{EF}$ and intersected by transversal $\overline{GH}$. If M ∠1 = (4x + 30) and m ∠2 = (2x + 50), find x.



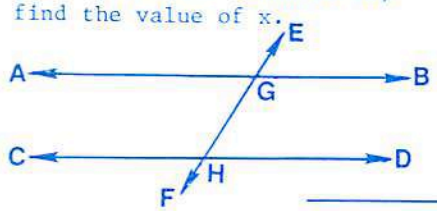
3. In the accompanying diagram, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, $\overleftrightarrow{HG}$ intersects $\overleftrightarrow{AB}$ at E and $\overleftrightarrow{CD}$ at F. If m ∠CFE = 105 and m ∠BEF = (2x + 5), find x.



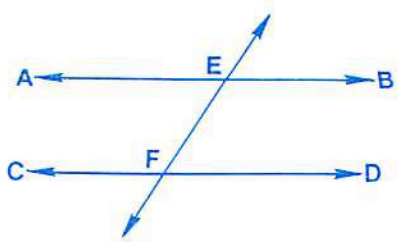
4. In the accompanying diagram, parallel lines m and l are cut by transversal t. If m ∠1 = (3x - 20) and the m ∠2 = (x + 100), find the degree measure of ∠2.



5. In the accompanying diagram, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ and $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ at G and $\overleftrightarrow{CD}$ at H. If m ∠AGH is (4x - 10) and m ∠GHD is 70, find the value of x.



6. In the diagram below, m ∠AEF = (5x - 15) and m ∠EFD = (2x + 45). If AB ∥ CD, find the value of x.

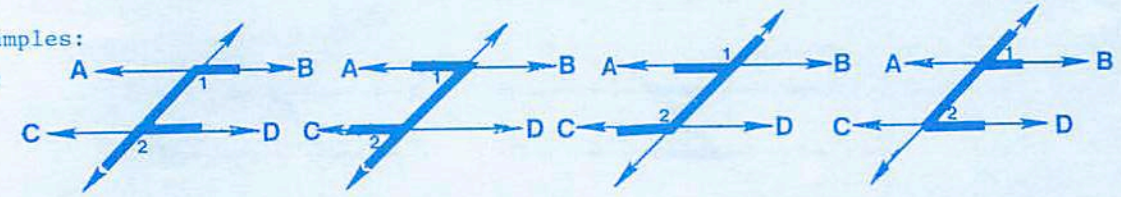


Corresponding Angles

REMEMBER

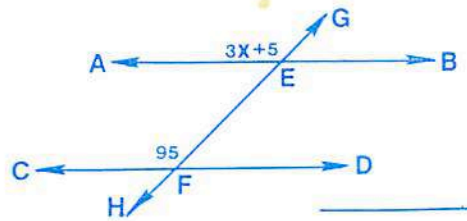
Corresponding angles formed by a transversal and parallel lines are equal. When traced, they look like an F, forward, backward or upside down.

Examples:

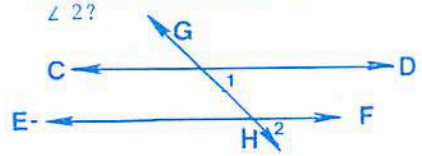


If line $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, then in all cases above $\angle 1$ and $\angle 2$ are corresponding angles and are equal.

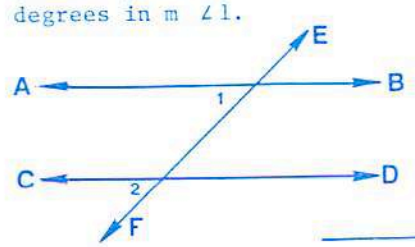
1. In the accompanying diagram $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ and are intersected by GH at points E and F respectively. If m $\angle$ AEG = (3x + 5) and m $\angle$ CFE = 95, find x.



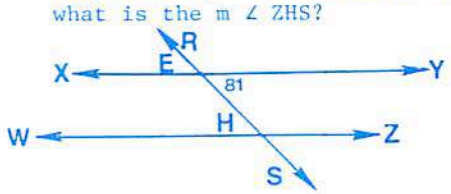
2. In the accompanying diagram, $\overleftrightarrow{CD} \parallel \overleftrightarrow{EF}$ and is interesected by transversal $\overleftrightarrow{GH}$. If m $\angle$ 1 = (2x + 20) and m $\angle$ 2 = (x + 40), what is the degree measure of $\angle$ 2?



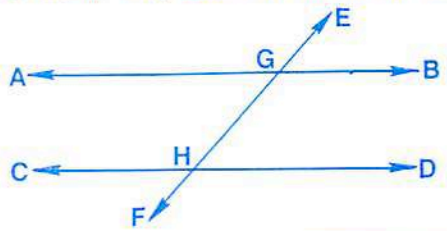
3. In the diagram below, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$. If m $\angle$ 1 = (6x - 30) and m $\angle$ 2 = (3x + 15) find the number of degrees in m $\angle$ 1.



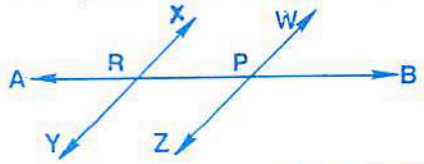
4. In the accompanying diagram, transversal $\overleftrightarrow{RS}$ intersects parallel lines $\overleftrightarrow{XY}$ and $\overleftrightarrow{WZ}$ at E and H, respectively. If m $\angle$ HEY = 81, what is the m $\angle$ ZHS?



5. In the diagram below, m $\angle$ EGB = (3x + 20) and m $\angle$ GHD = (2x + 40). If $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, find the value of x.



6. In the accompanying diagram, $\overleftrightarrow{XY} \parallel \overleftrightarrow{WZ}$ and meet transversal $\overleftrightarrow{AB}$ in points R and P respectively. If m $\angle$ YRP = 120 and m $\angle$ ZPB = 4x - 20, find the value of x.

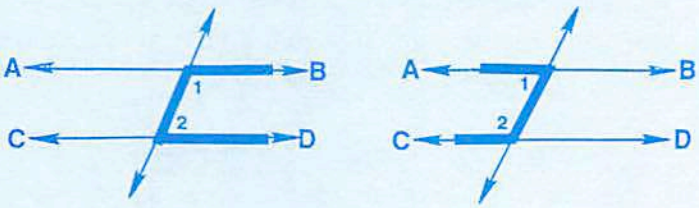


Interior Angles on the Same Side of the Transversal

REMEMBER

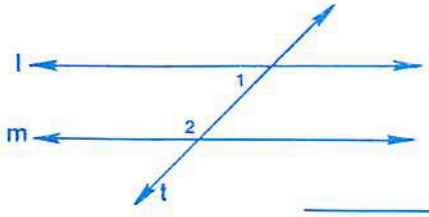
Interior angles on the same side of the transversal formed by the transversal and parallel lines are supplementary. When traced, they look like a ⊏ or a ⊐.

Examples:



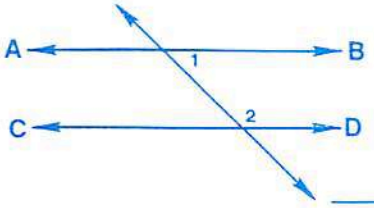
If line $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, then in both cases above ∠ 1 and ∠ 2 are interior angles on the same side of the transversal and add up to 180°.

1. In the accompanying diagram, line l is parallel to line m and they are intersected by transversal t. If m ∠ 1 = 42, find the measure of ∠ 2.

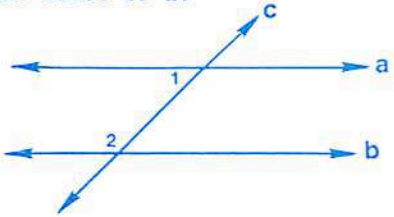


2. In the diagram below, the m ∠ 1 = (3x + 20) and m ∠ 2 = (2x + 30).

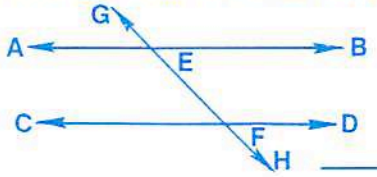
If AB ∥ CD, find the value of x.



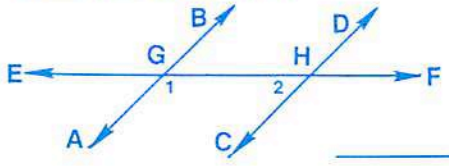
3. In the accompanying diagram, line a is parallel to line b and they are intersected by transversal c. If m ∠ 1 = (4x - 10) and m ∠ 2 = 110°, find the value of x.



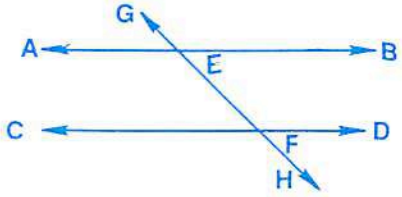
4. In the accompanying diagram, $\overleftrightarrow{AD} \parallel \overleftrightarrow{CD}$ and intersects transversal $\overleftrightarrow{GH}$ at points E and F respectively. If m ∠ AEF = 124 and m ∠ EFC = (2x + 20) find the value of x.



5. In the accompanying diagram, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ and transversal $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ at G and $\overleftrightarrow{CD}$ at H. If m ∠ 1 = (4x + 50) and m ∠ 2 = (x + 30), find the value of x.



6. In the accompanying diagram, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ and intersects transversal $\overleftrightarrow{GH}$ at points E and F respectively. Name two pairs of interior angles on the same side of the transversal.



Angles and the Triangle

REMEMBER

Every triangle has three angles and the sum of the measures of the angles of a triangle is 180°.

Example: The measures of the angles of a triangle are represented by x, 3x, and (x + 60). Find the number of degrees in the measure of the smallest angle of the triangle.

$$x + 3x + x + 60 = 180$$
$$5x + 60 = 180$$
$$5x = 120$$
$$x = 24 \text{ ans.}$$

1. The degree measures of the angles of a triangle are represented by x, 2x, and 3x. Find the number of degrees in the smallest angle.

_____

2. In triangle ABC, m ∠ A = x, m ∠ B = (x + 10), and m ∠ C = (3x + 20). What is the number of degrees in the measure of ∠ A?

_____

3. If two angles of a triangle are complementary, what is the degree measure of the third angle?

_____

4. Two angles of a triangle are equal in measure and the third angle is 110°. Find the number of degrees in one of the two equal angles.

_____

5. If the angles of a triangle are in the ratio of 2:3:5, how many degrees are there in the largest angle of the triangle?

_____

6. In triangle EDF, m ∠ E = (x + 10), m ∠ D = (3x + 30), and m ∠ F = (5x + 50). How many degrees are there in ∠ F?

_____

7. Could two angles of a triangle ever be supplementary? (yes or no)

_____

8. The three angles of a triangle are in the ratio of 5:6:7. Find the number of degrees in the smallest angle of the triangle.

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