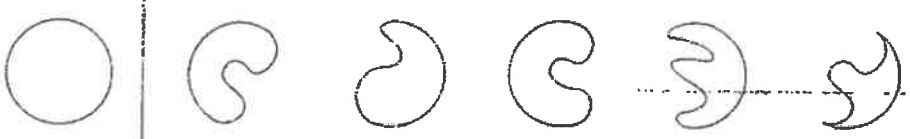
POD

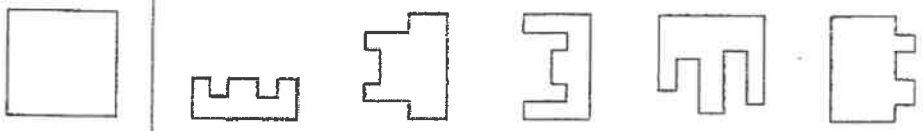
Name _____

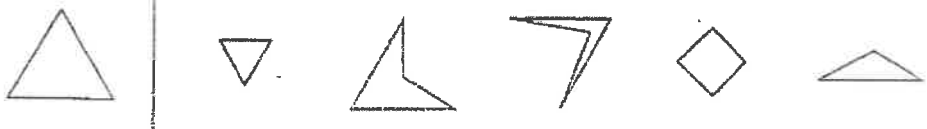
Extend Your Thinking 5-1

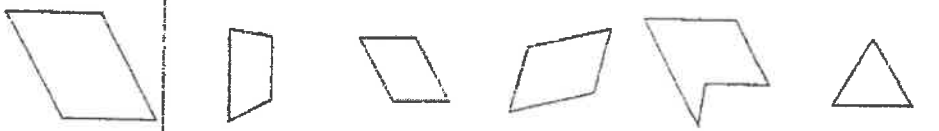
Visual Thinking

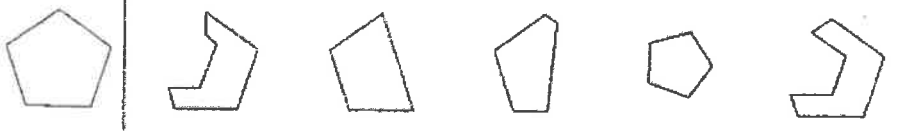
Circle the letters of the figures on the right that when joined together will form the figure on the left.

1. 

2. 

3. 

4. 

5. 

6. 

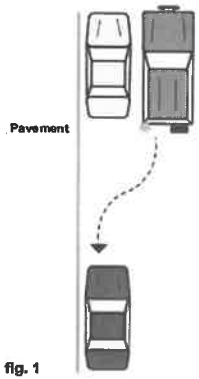
PARALLEL LINES

- Def: lines that do not intersect.
- Illustration:

- Notation: $\ell \parallel m$ $\quad \overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$

Examples of Parallel Lines

- Hardwood Floor
- Opposite sides of windows, desks, etc.
- Parking slots in parking lot
- Parallel Parking
- Streets: Westmore Meyers & Ardmore

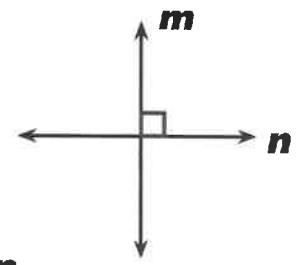


Examples of Parallel Lines

- Streets: Belmont & School

PERPENDICULAR LINES

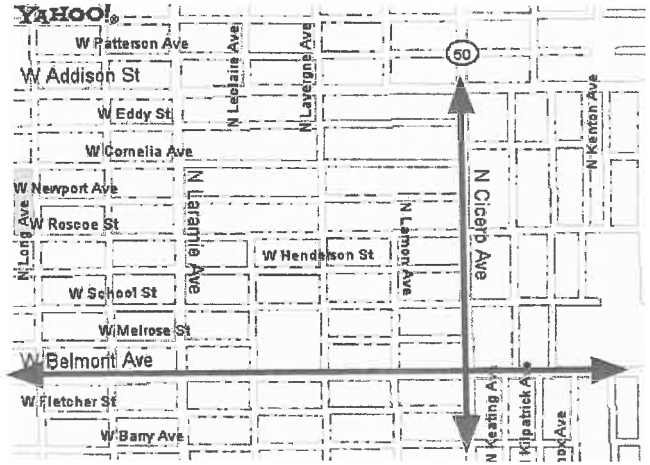
- Def: Lines that intersect to form a right angle.
- Illustration:



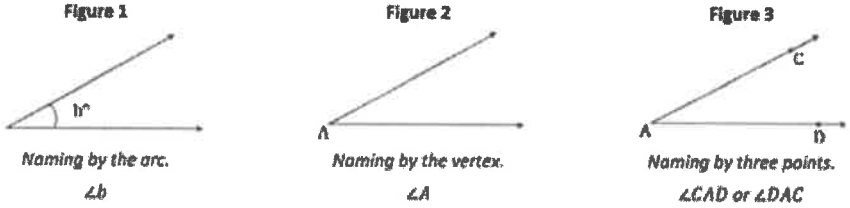
- Notation: $m \perp n$
- Key Fact: 4 right angles are formed.

Ex. of Perpendicular Lines

- *Window panes*
- *Streets: Westmore Meyers & Jackson St*

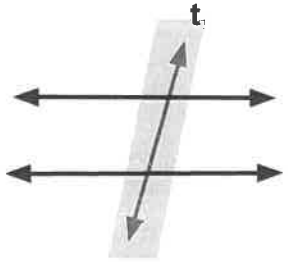


How to name Angles:



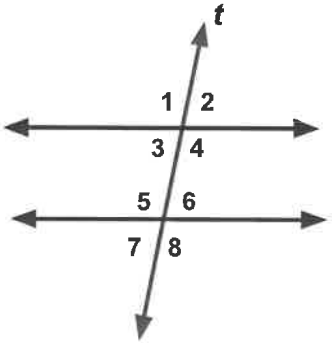
Transversal

- Def: a line that intersects two lines at different points
- Illustration:



Vertical Angles

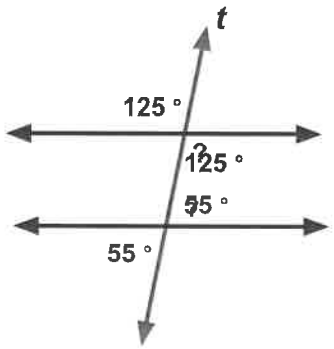
- Two angles that are **opposite** angles.



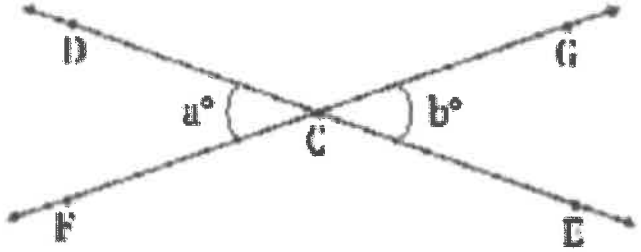
$\angle 1 \cong \angle 4$
$\angle 2 \cong \angle 3$
$\angle 5 \cong \angle 8$
$\angle 6 \cong \angle 7$

Vertical Angles

- Find the measures of the missing angles



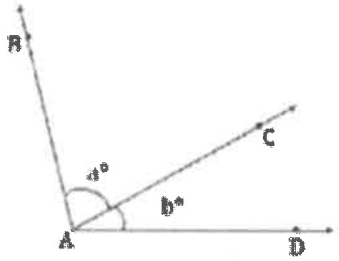
Another Example of Vertical Angles



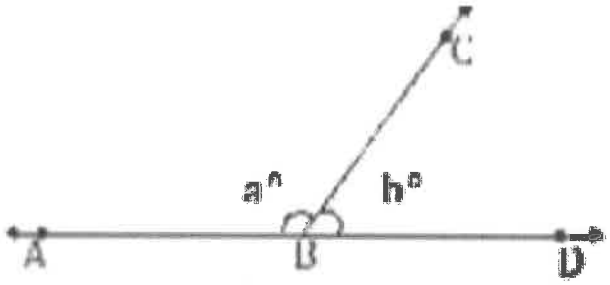
Adjacent Angles

Two angles, ∠BAC and ∠CAD with a common side $\overrightarrow{AC}$, are adjacent angles if C belongs to the interior of ∠BAD.

Angles a and b are adjacent angles; ∠BAC and ∠CAD are adjacent angles.



Supplementary Angles

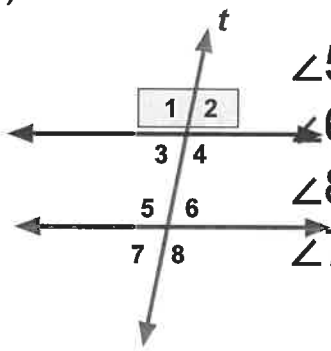


- Two adjacent angles that form a **line** (sum=180°)

Supplementary Angles/ Linear Pair

- Two adjacent angles that form a **line** (sum=180°)

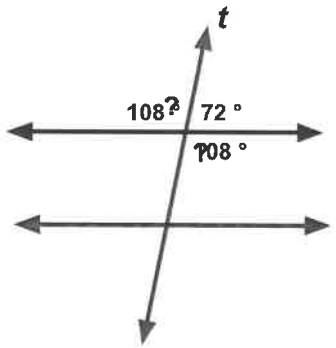
∠1+∠2=180
∠2+∠4=180
∠4+∠3=180
∠3+∠1=180



∠5+∠6=180
∠6+∠8=180
∠8+∠7=180
∠7+∠5=180

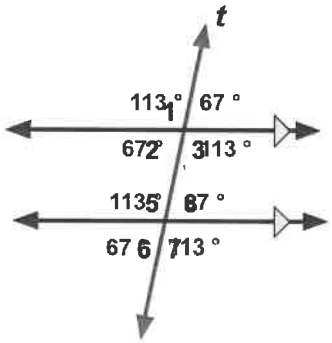
Supplementary Angles/ Linear Pair

- Find the measures of the missing angles



180 - 72

Find all angle measures



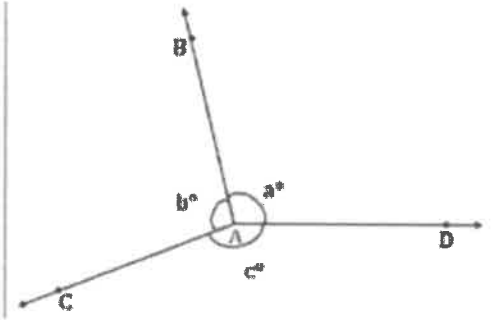
180 - 67

Angles at a point

The measure of all angles formed by three or more rays with the same vertex is 360°.

$a + b + c = 360$

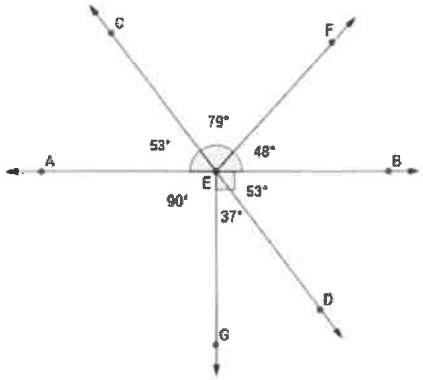
$m\angle BAC + m\angle CAD + m\angle DAB = 360°$



Opening Exercise

Use the diagram to complete the chart.

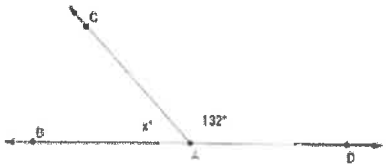
Name the angles that are ...	
Vertical	
Adjacent	
Angles on a line	
Angles at a point	



Example 1

Estimate the measurement of x. _____

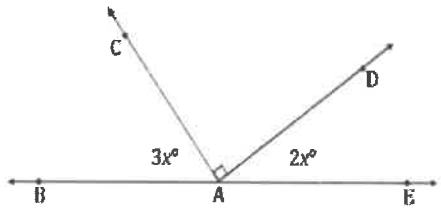
In a complete sentence, describe the angle relationship in the diagram.



Write an equation for the angle relationship shown in the figure and solve for x. Then, find the measures of $\angle BAC$ and confirm your answers by measuring the angle with a protractor.

Exercise 1

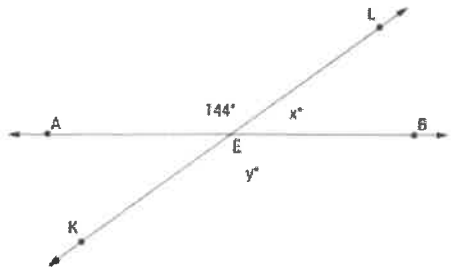
In a complete sentence, describe the angle relationship in the diagram.



Find the measurements of $\angle BAC$ and $\angle DAE$.

Example 2

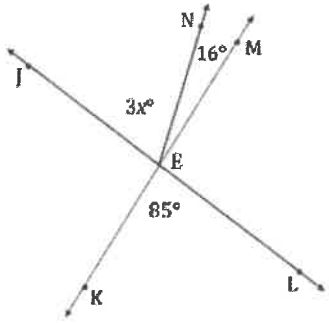
In a complete sentence, describe the angle relationship in the diagram.



Write an equation for the angle relationship shown in the figure and solve for x and y. Find the measurements of $\angle LEB$ and $\angle KEB$.

Exercise 2

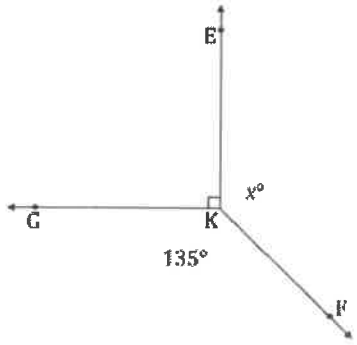
In a complete sentence, describe the angle relationships in the diagram.



Write an equation for the angle relationship shown in the figure and solve for x.

Example 3

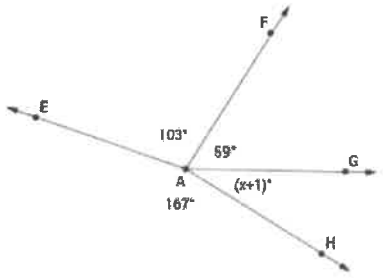
In a complete sentence, describe the angle relationships in the diagram.



Write an equation for the angle relationship shown in the figure and solve for x. Find the measurement of $\angle EKF$ and confirm your answers by measuring the angle with a protractor.

Exercise 3

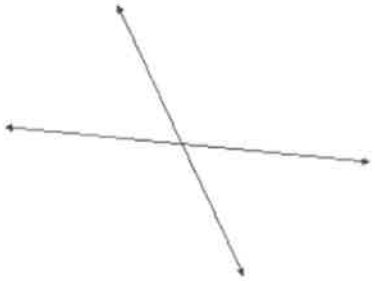
In a complete sentence, describe the angle relationships in the diagram.



Find the measurement of $\angle GAH$.

Example 4

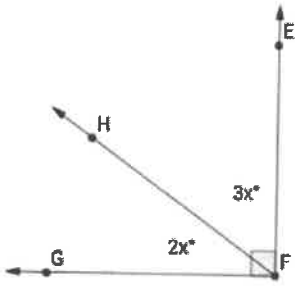
The following two lines intersect. The ratio of the measurements of the obtuse angle to the acute angle in any adjacent angle pair in this figure is 2 : 1. In a complete sentence, describe the angle relationships in the diagram.



Label the diagram with expressions that describe this relationship. Write an equation that models the angle relationship and solve for x. Find the measurements of the acute and obtuse angles.

Exercise 4

The ratio of $m\angle GFH$ to $m\angle EFH$ is 2 : 3. In a complete sentence, describe the angle relationships in the diagram.



Find the measures of $\angle GFH$ and $\angle EFH$.

Relevant Vocabulary

ADJACENT ANGLES: Two angles $\angle BAC$ and $\angle CAD$ with a common side $\overrightarrow{AC}$ are *adjacent angles* if C belongs to the interior of $\angle BAD$.

VERTICAL ANGLES: Two angles are *vertical angles* (or *vertically opposite angles)* if their sides form two pairs of opposite rays.

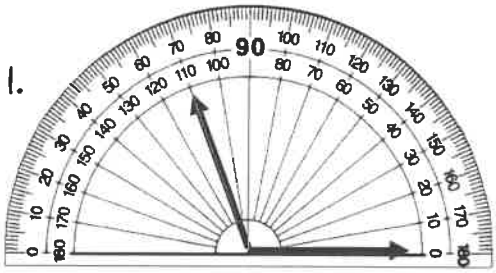
ANGLES ON A LINE: The sum of the measures of adjacent *angles on a line* is $180°$.

ANGLES AT A POINT: The sum of the measures of adjacent *angles at a point* is $360°$.

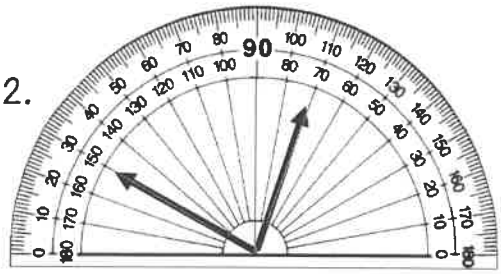
Name: _____

Measuring Angle with Protractors

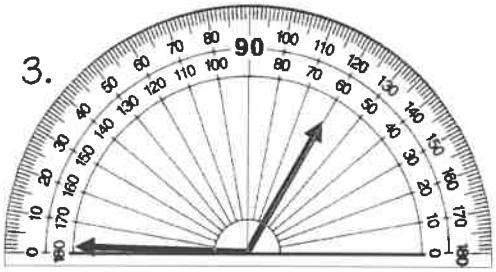
What is the measurement of each angle?

1. 

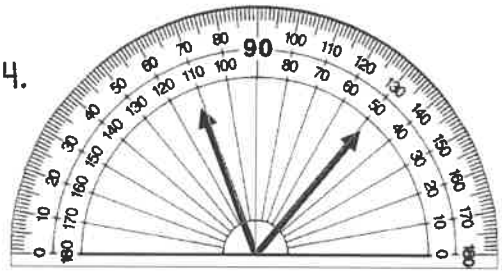
Angle Measurement: _____

2. 

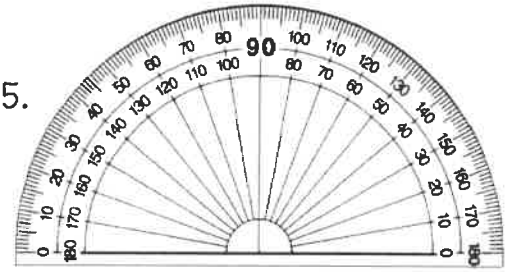
Angle Measurement: _____

3. 

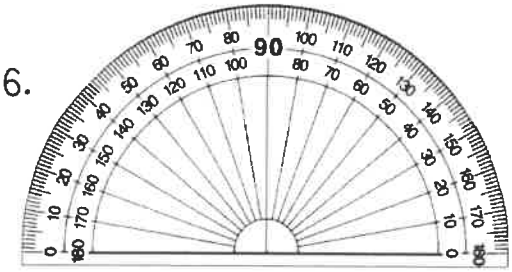
Angle Measurement: _____

4. 

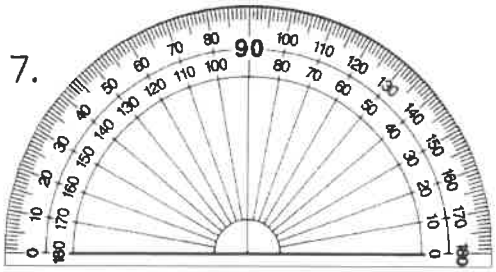
Angle Measurement: _____

5. 

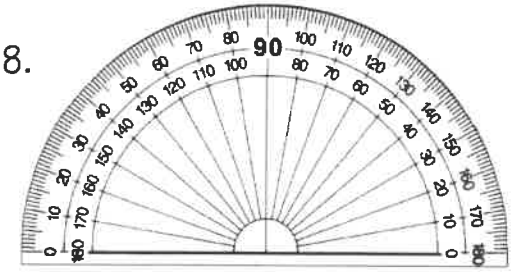
Draw an angle that measures
45°

6. 

Draw an angle that measures
110°

7. 

Draw an angle that measures
90°

8. 

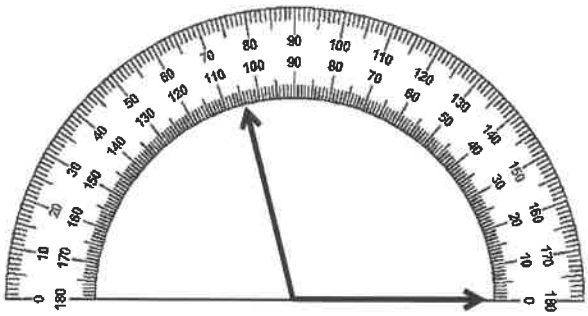
Draw an angle that measures
25°

bloomin' LILLY

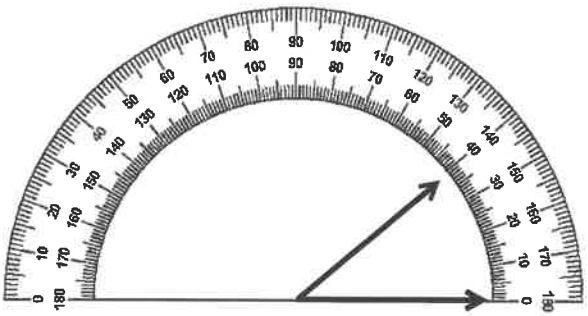
Name _____ Date _____

Protractor Practice

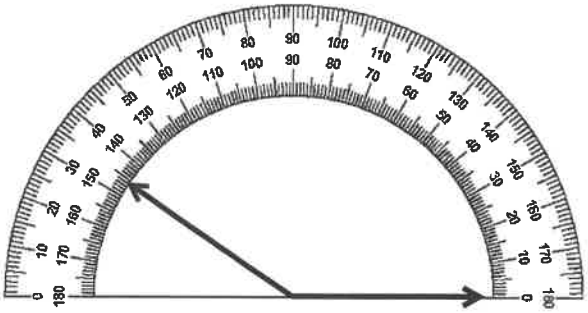
For each problem, identify the measurement of the given angle. The first one has been done for you.



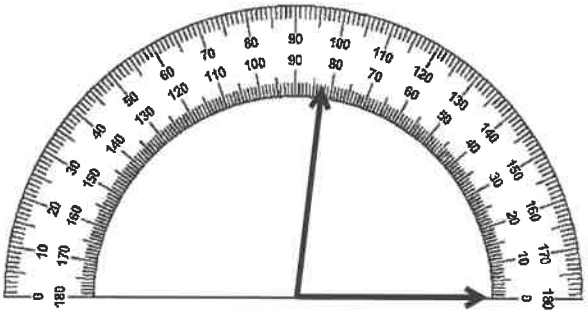
1. Size of the angle? _____°



2. Size of the angle? _____°

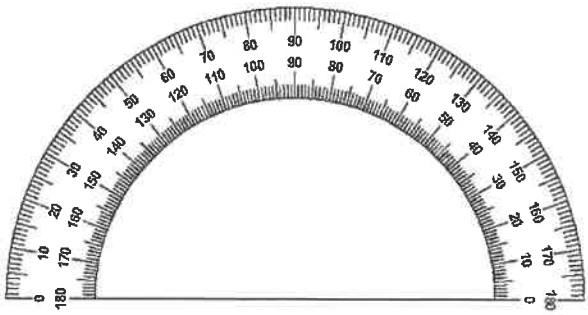


3. Size of the angle? _____°

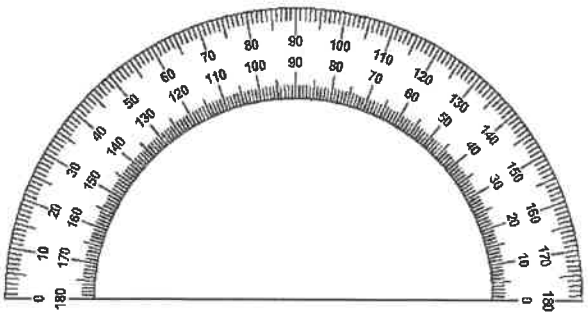


4. Size of the angle? _____°

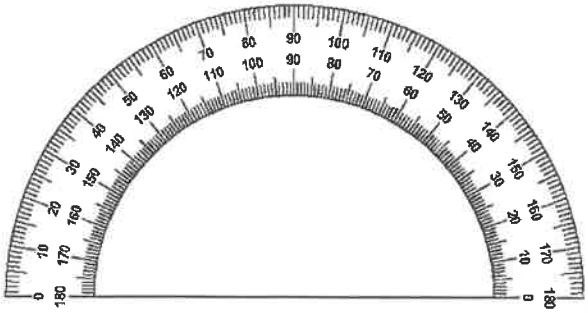
For each problem, draw the given angle inside the protractor.



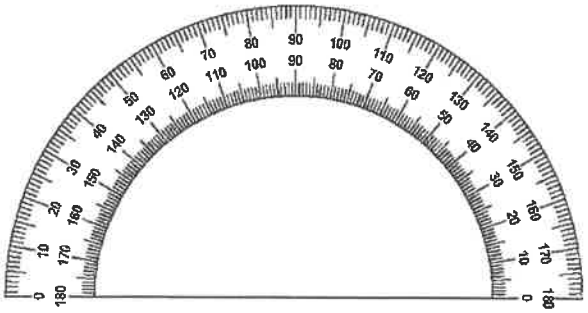
5. Construct a 20° angle.



6. Construct a 155° angle.



7. Construct an 81° angle.



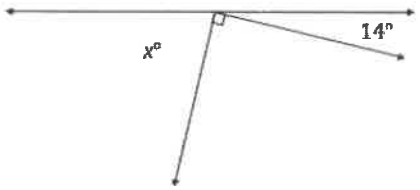
8. Construct a 129° angle.

Lesson 11: Angle Problems and Solving Equations

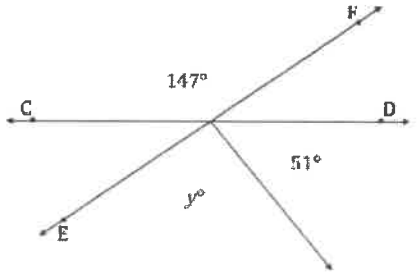
Classwork

Opening Exercise

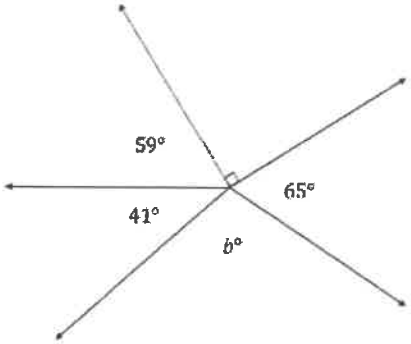
a. In a complete sentence, describe the angle relationship in the diagram. Write an equation for the angle relationship shown in the figure and solve for x. Confirm your answers by measuring the angle with a protractor.



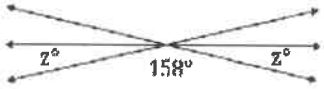
b. $\overleftrightarrow{CD}$ and $\overleftrightarrow{EF}$ are intersecting lines. In a complete sentence, describe the angle relationship in the diagram. Write an equation for the angle relationship shown in the figure and solve for y. Confirm your answers by measuring the angle with a protractor.



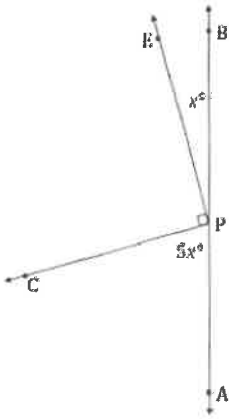
c. In a complete sentence, describe the angle relationship in the diagram. Write an equation for the angle relationship shown in the figure and solve for b. Confirm your answers by measuring the angle with a protractor.



d. The following figure shows three lines intersecting at a point. In a complete sentence, describe the angle relationship in the diagram. Write an equation for the angle relationship shown in the figure and solve for z. Confirm your answers by measuring the angle with a protractor.

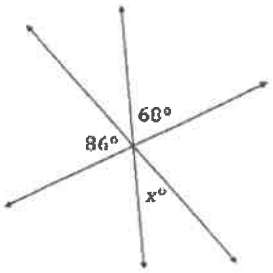


e. Write an equation for the angle relationship shown in the figure and solve for x. In a complete sentence, describe the angle relationship in the diagram. Find the measurements of $\angle EPB$ and $\angle CPA$. Confirm your answers by measuring the angle with a protractor.



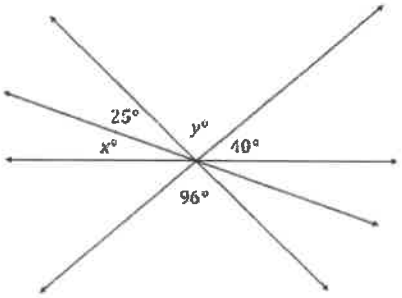
Example 1

The following figure shows three lines intersecting at a point. In a complete sentence, describe the angle relationship in the diagram. Write an equation for the angle relationship shown in the figure and solve for x. Confirm your answers by measuring the angle with a protractor.



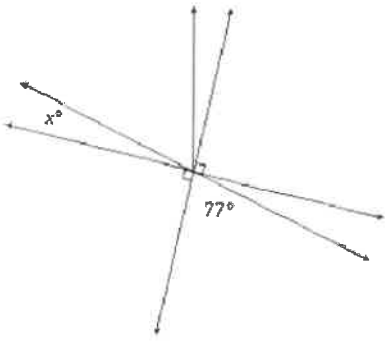
Exercise 1

The following figure shows four lines intersecting at a point. In a complete sentence, describe the angle relationships in the diagram. Write an equation for the angle relationship shown in the figure and solve for x and y. Confirm your answers by measuring the angle with a protractor.



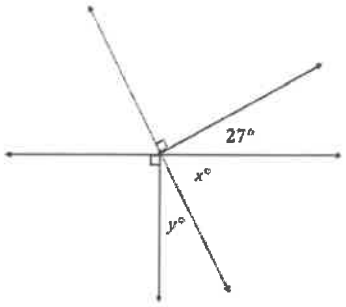
Example 2

In a complete sentence, describe the angle relationships in the diagram. You may label the diagram to help describe the angle relationships. Write an equation for the angle relationship shown in the figure and solve for x. Confirm your answers by measuring the angle with a protractor.



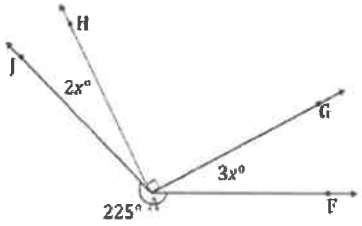
Exercise 2

In a complete sentence, describe the angle relationships in the diagram. Write an equation for the angle relationship shown in the figure and solve for x and y. Confirm your answers by measuring the angles with a protractor.



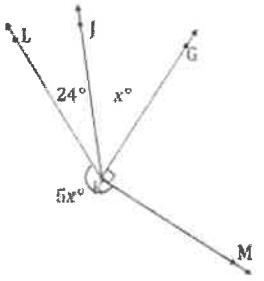
Example 3

In a complete sentence, describe the angle relationships in the diagram. Write an equation for the angle relationship shown in the figure and solve for x. Find the measures of $\angle JAH$ and $\angle GAF$. Confirm your answers by measuring the angle with a protractor.



Exercise 3

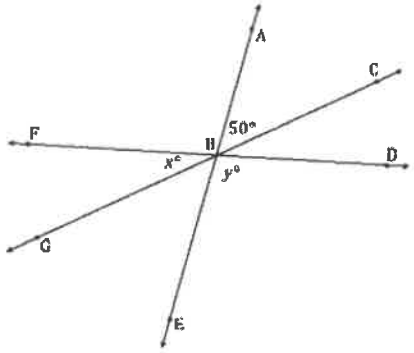
In a complete sentence, describe the angle relationships in the diagram. Write an equation for the angle relationship shown in the figure and solve for x. Find the measures of $\angle JKG$. Confirm your answer by measuring the angle with a protractor.



Example 4

In the accompanying diagram, the measure of $\angle DBE$ is four times the measure of $\angle FBG$.

a. Label $\angle DBE$ as $y°$ and $\angle FBG$ as $x°$. Write an equation that describes the relationship between $\angle DBE$ and $\angle FBG$.



b. Find the value of x.

c. Find the measures of $\angle FBG$, $\angle CBD$, $\angle ABF$, $\angle GBE$, and $\angle DBE$.

d. What is the measure of $\angle ABG$? Identify the angle relationship used to get your answer.