Warm up

Solve for the variable.

1. $4c + 21 = 63$

2. $-5x = 53$

3. $8 = -2w$

Unit 5: Geometry ☺

Common Core GPS

MCC7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

11-1 Classifying Angles

15 min: Basics review

Do you remember how to….

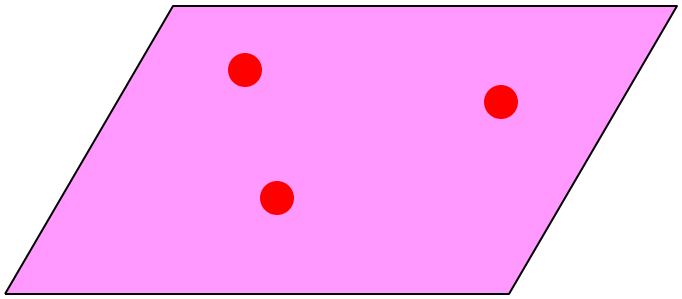
Draw and name each figure.

1. line segment

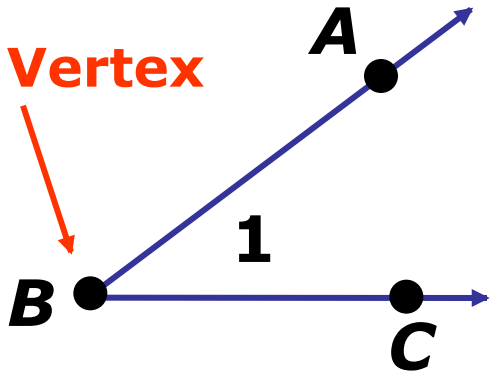
2. line

3. ray

4. plane

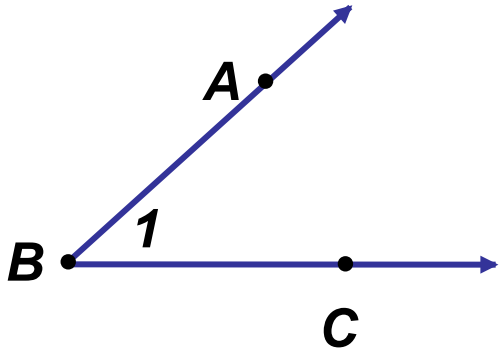


An **angle** is formed by two rays with a common endpoint. The two rays are the sides of the angle. The common endpoint is the **vertex.**



Angles are measured in degrees (°).

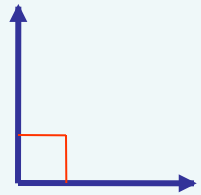
Write this



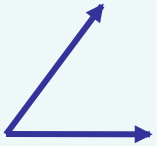
You can name this angle $\angle ABC$, $\angle CBA$, $\angle B$, or $\angle 1$.

An angle's measure determines the type of angle it is.

A **right angle** is an angle that that measures exactly 90°. The symbol ⌝ indicates a right angle.

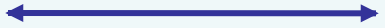


An **acute angle** is an angle that measures less than 90°.



An **obtuse angle** is an angle that measures more than 90° but less than 180°.

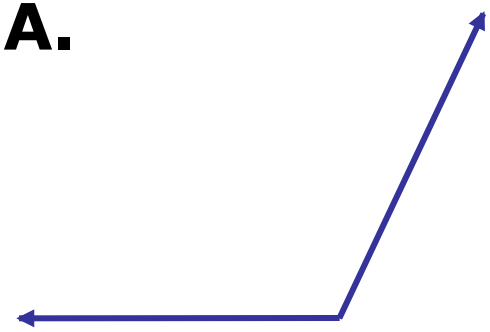
A **straight angle** is an angle that measures exactly 180°.



Oral

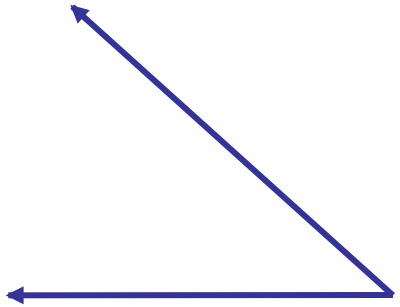
Tell whether each angle is acute, right, obtuse or straight.

A.



obtuse angle

B.

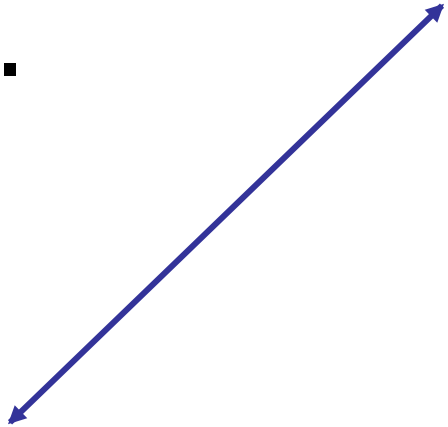


acute angle

Oral

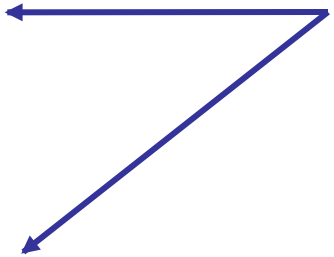
Tell whether each angle is acute, right, obtuse, or straight.

A.



straight angle

B.



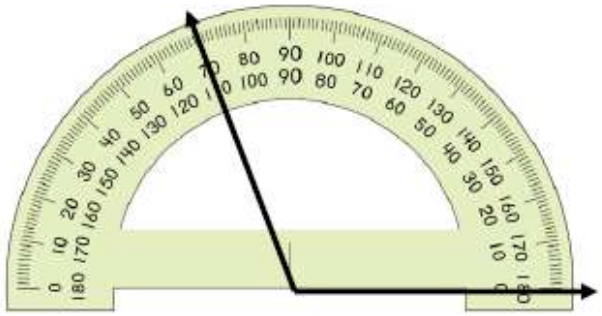
acute angle

15 min: protractor usage

Protractor usage

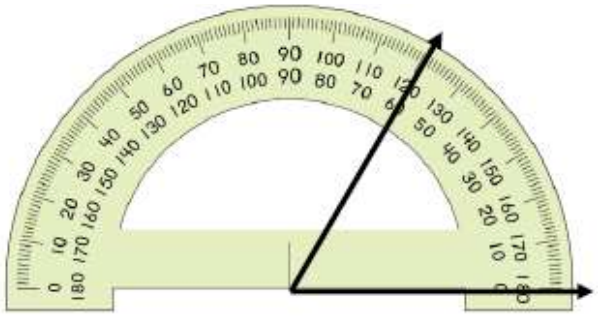
https://www.khanacademy.org/math/geometry/parallel-and-perpendicular-lines/Angle_basics/v/using-a-protractor

Practice Glue in



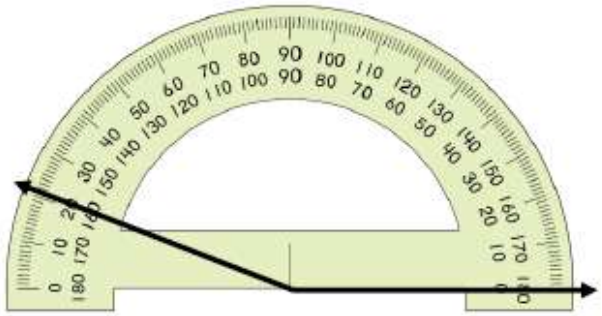
Measure of Angle _____

Type of Angle _____



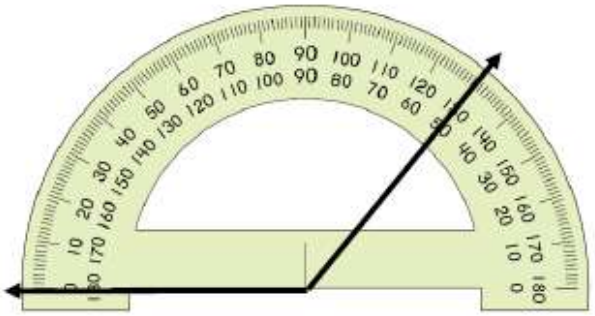
Measure of Angle _____

Type of Angle _____



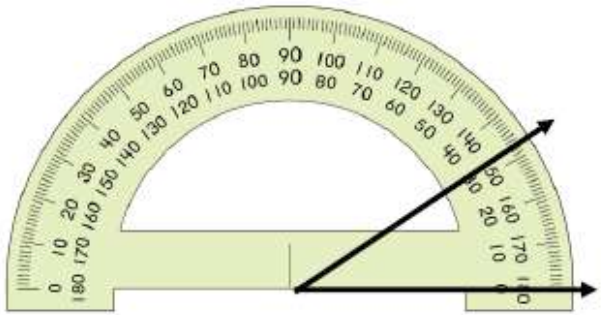
Measure of Angle _____

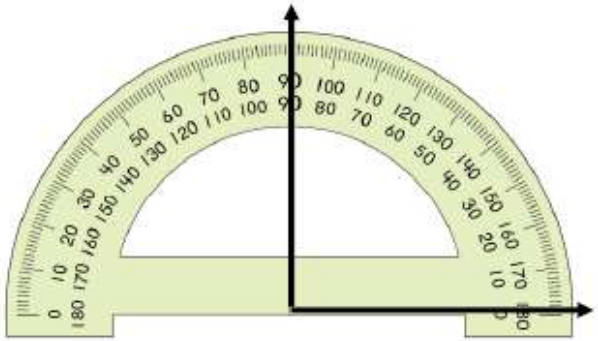
Type of Angle _____



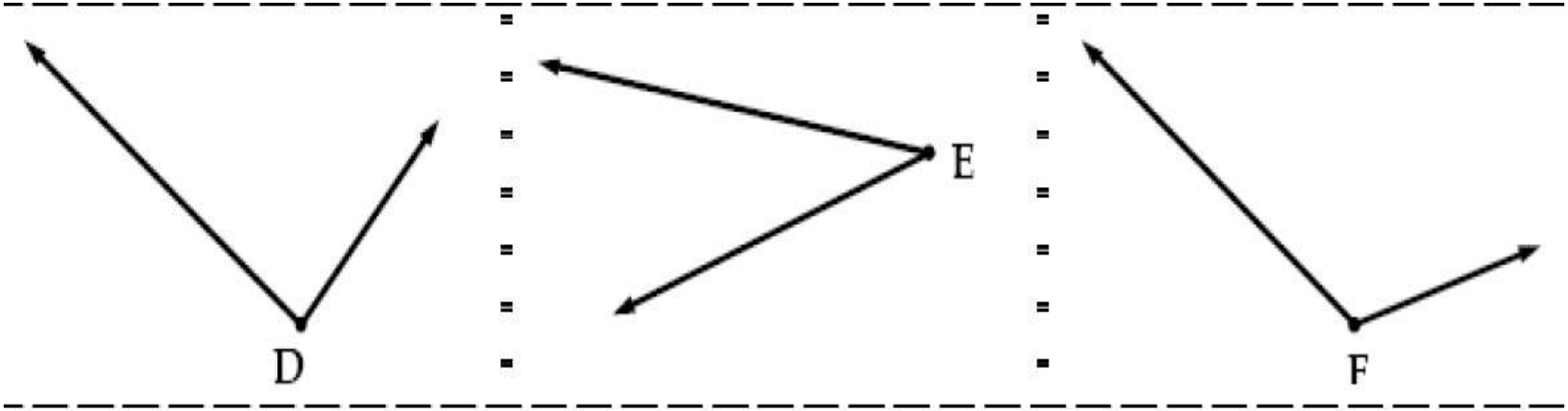
Measure of Angle _____

Type of Angle _____

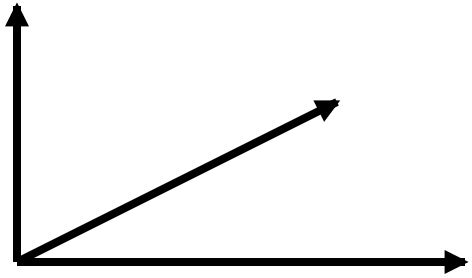


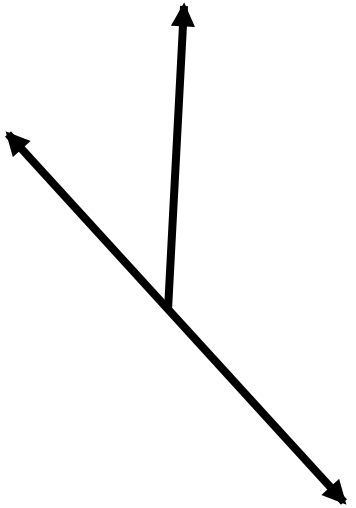


Ticket Question:

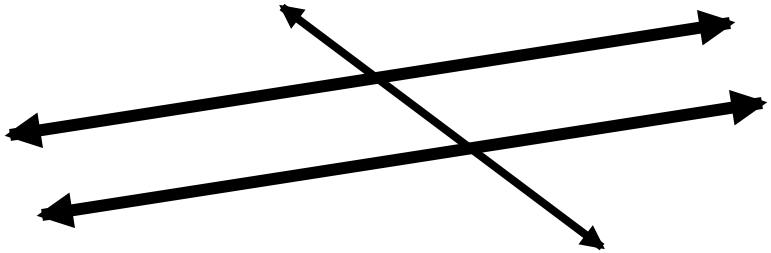


Angle Relationships
&
Parallel Lines





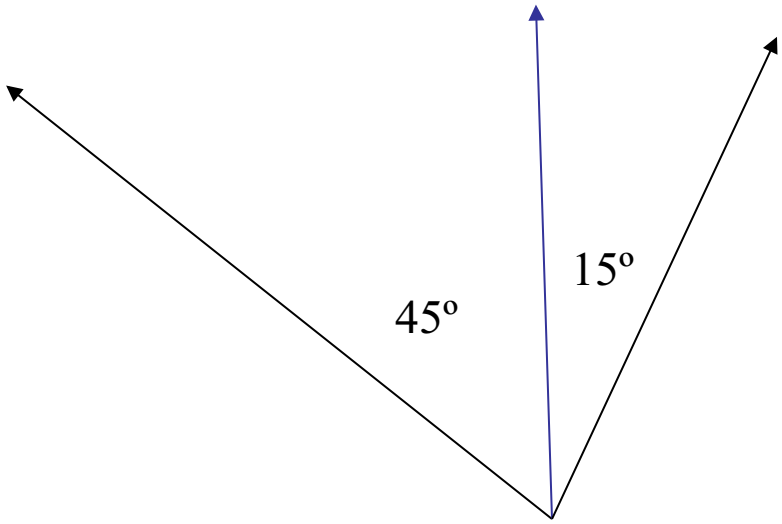
Pre-Algebra



Foldable

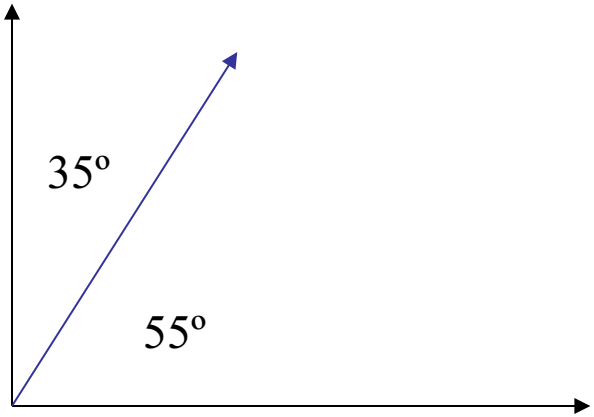
3rd Flap: Adjacent Angles

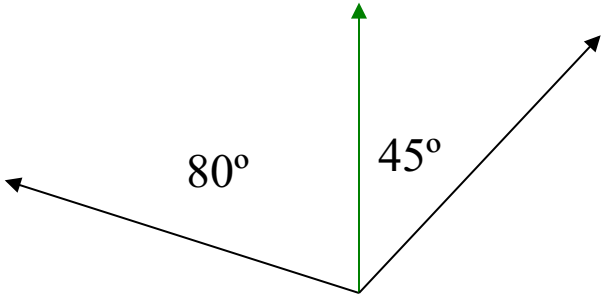
Two angles that are “side by side” and share a common vertex and ray.

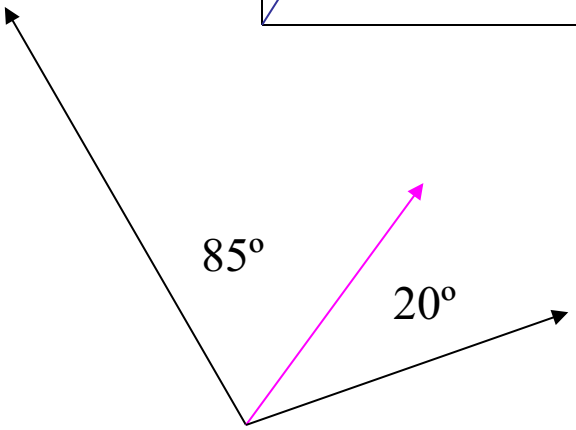


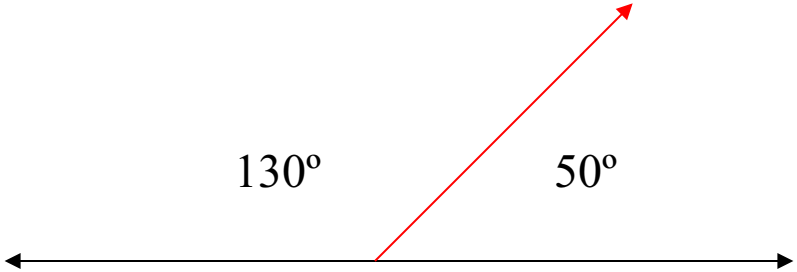
May or may not be congruent

These are examples of adjacent angles.

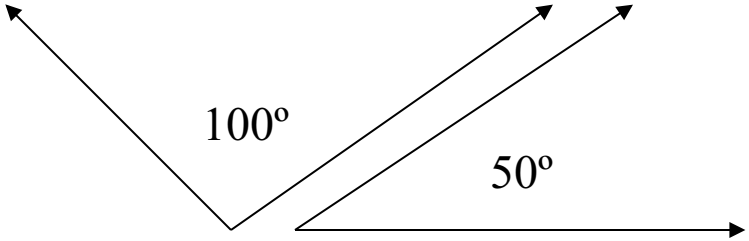


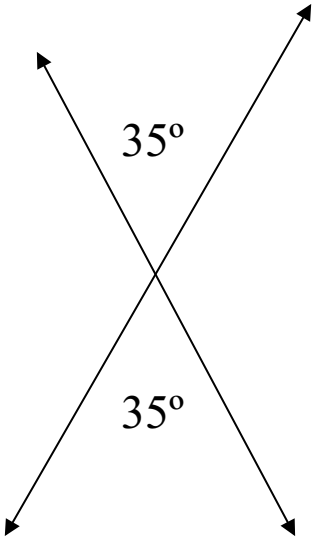


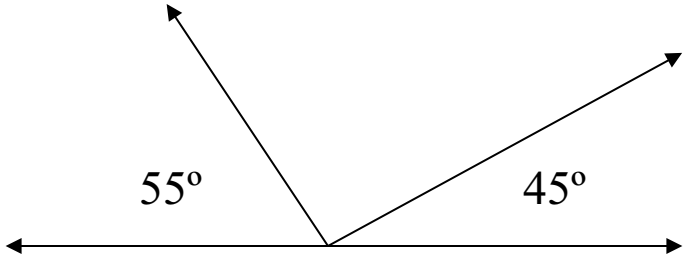




These angles are NOT adjacent.

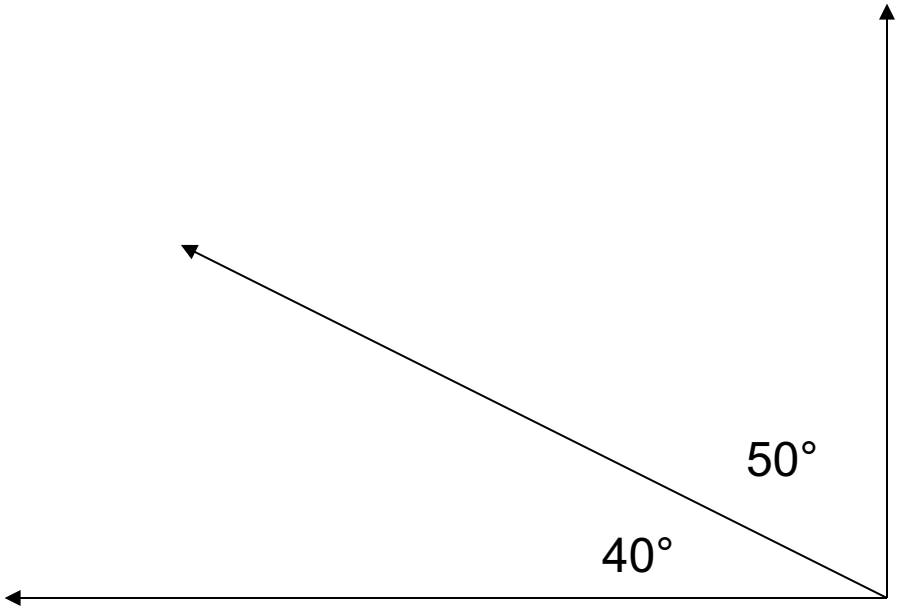




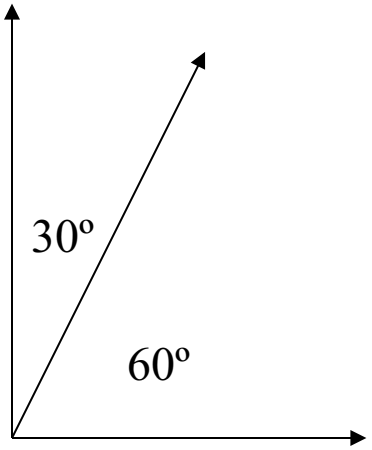


1st Flap: Complementary Angles

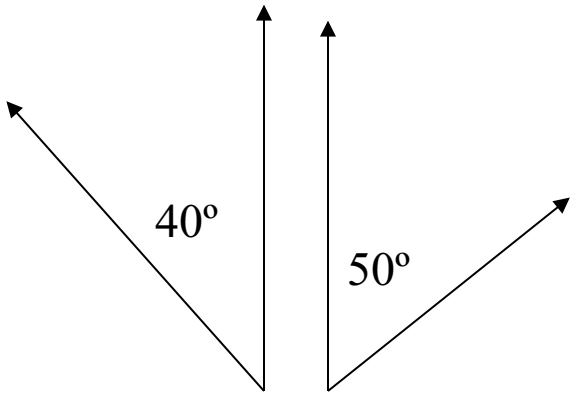
Two angles whose measures have a sum of 90º.



Complementary Angles sum to 90°



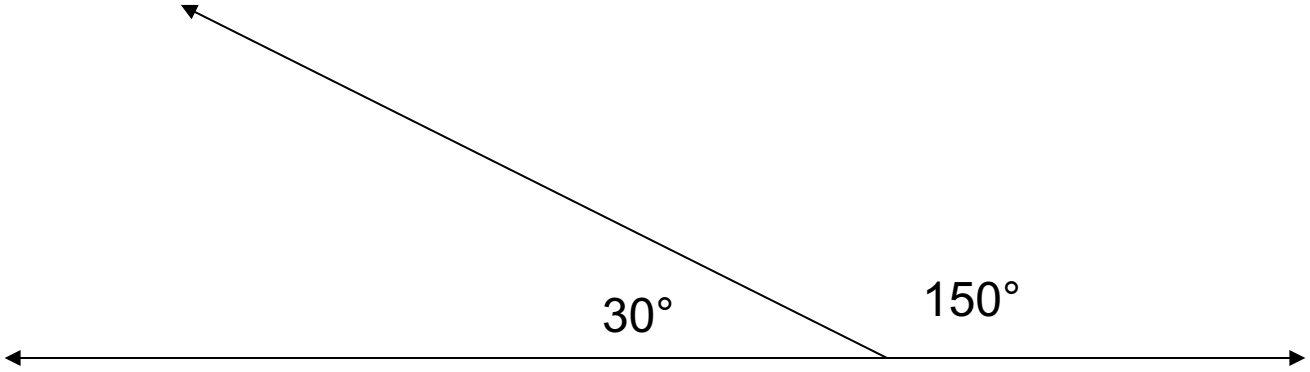
Adjacent and Complementary Angles



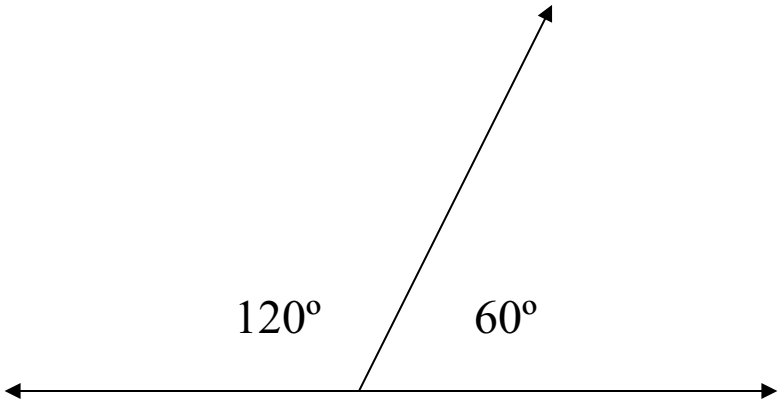
Complementary Angles but not Adjacent

2nd Flap: Supplementary Angles

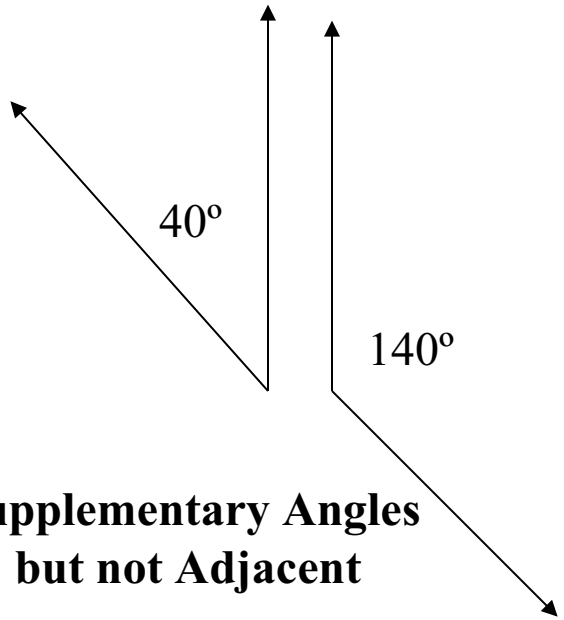
Two angles whose measures have a sum of 180º.



Supplementary angles add up to 180º.



Adjacent and Supplementary Angles

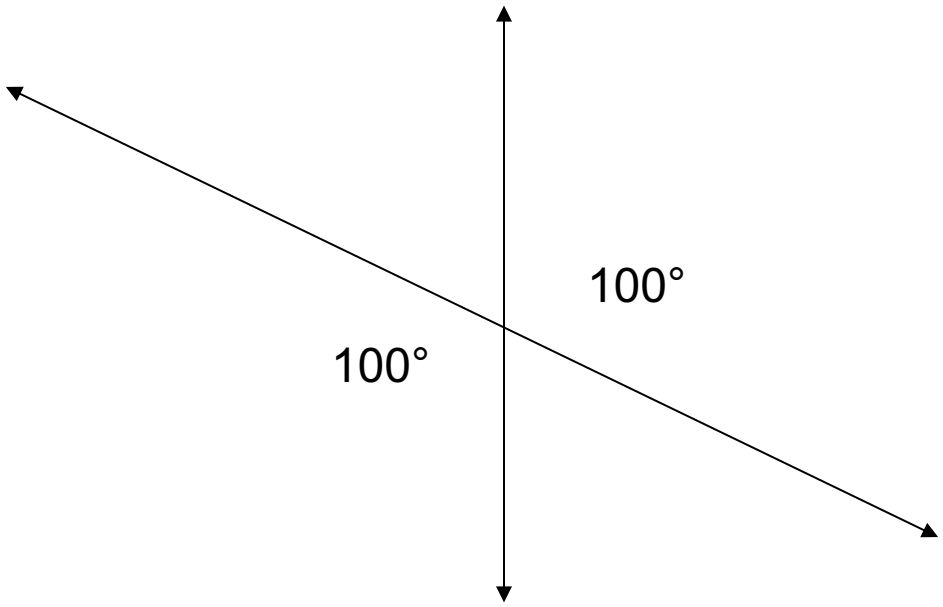


Supplementary Angles but not Adjacent

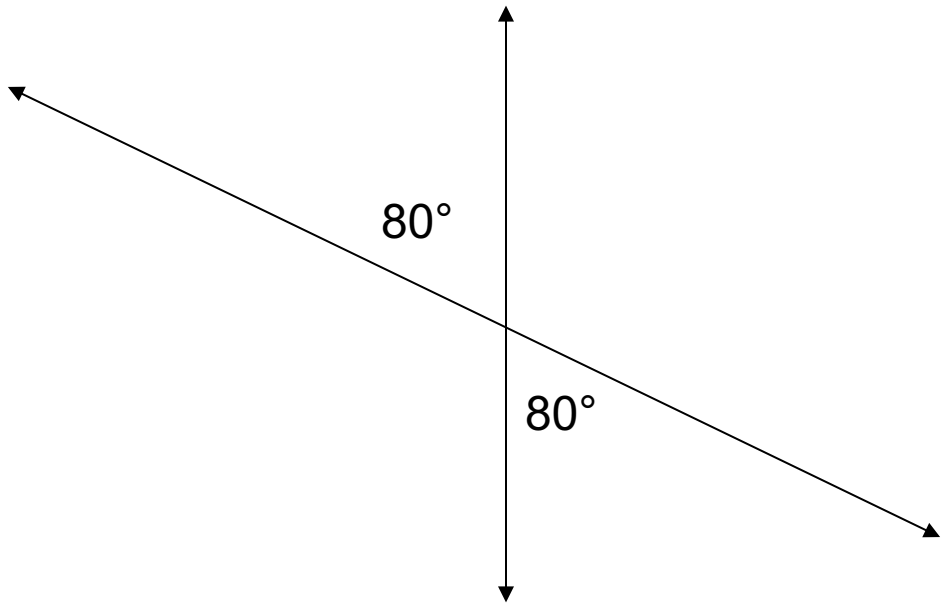
4^{th} Flap: Vertical Angles

- Two angles formed by two intersecting lines
- Always congruent
- Have the same angle measurement

Vertical Angles
are opposite one another.
Vertical angles are congruent.



Vertical Angles
are opposite one another.
Vertical angles are congruent.



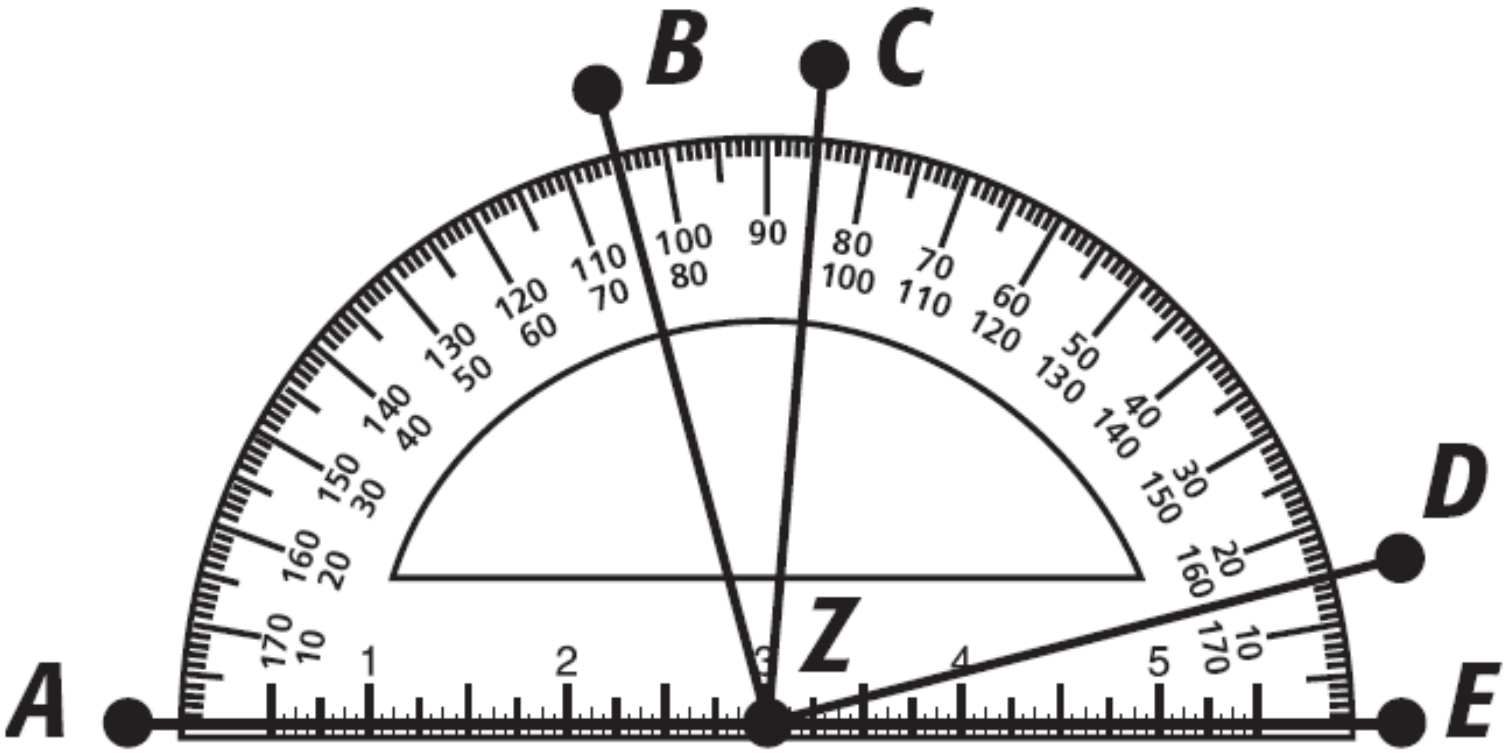
Ticket Review

Stop

Let's Practice the standard

MCC7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

Use the diagram to tell whether the angles are complementary, supplementary, or neither.



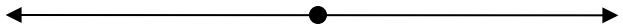
1. $\angle AZB$ and $\angle BZC$ **neither**

2. $\angle BZC$ and $\angle CZD$ **complementary**

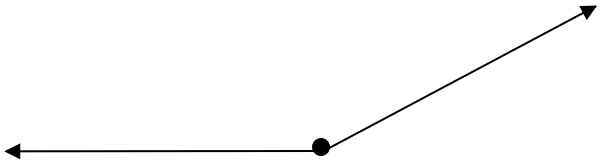
3. Angles *M* and *N* are supplementary. If $m\angle M$ is 117°, what is $m\angle N$? **63°**

Sketch each pic

Tell whether each angle is acute, right, obtuse, or straight.

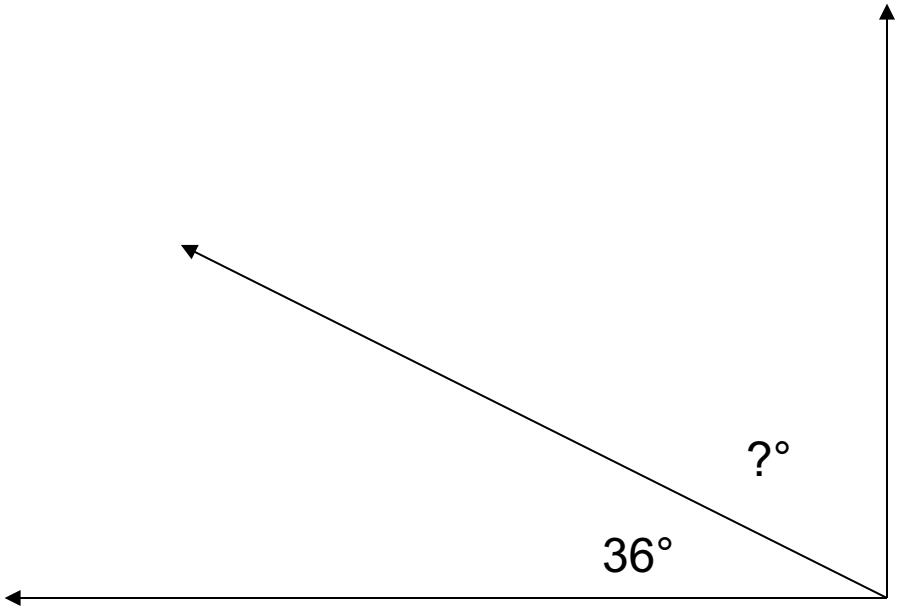


straight

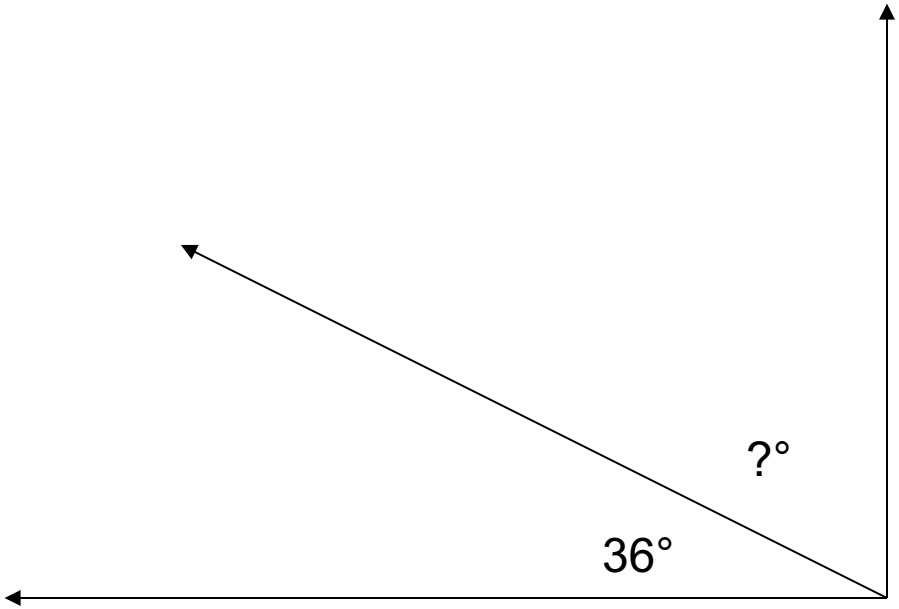


obtuse

1) Find the missing angle.

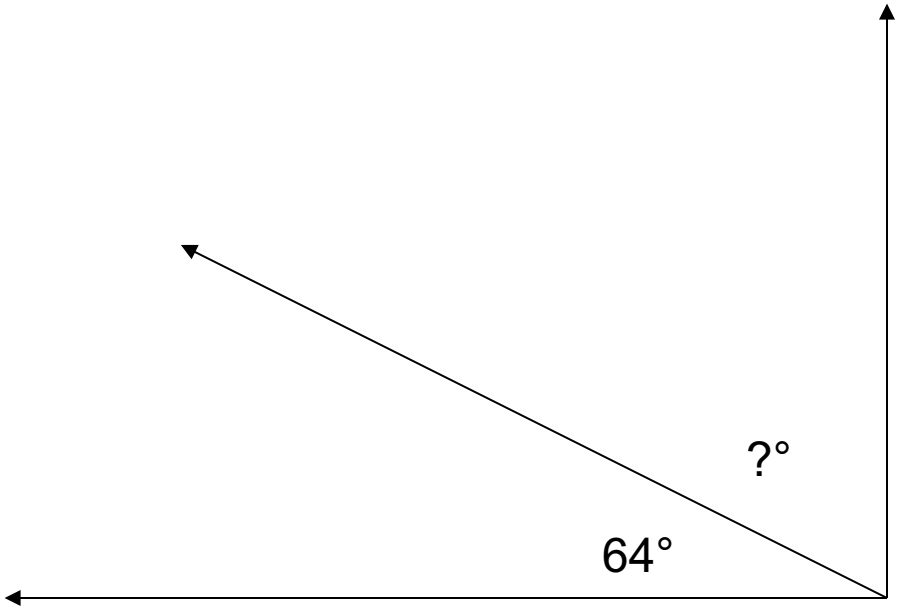


1) Find the missing angle.

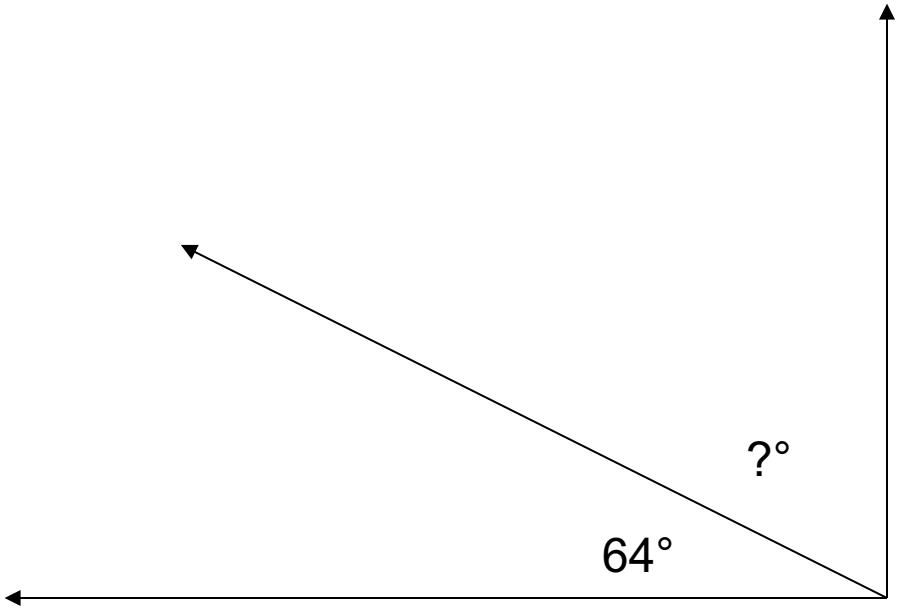


90 ° – 36 = 54°

2) Find the missing angle.

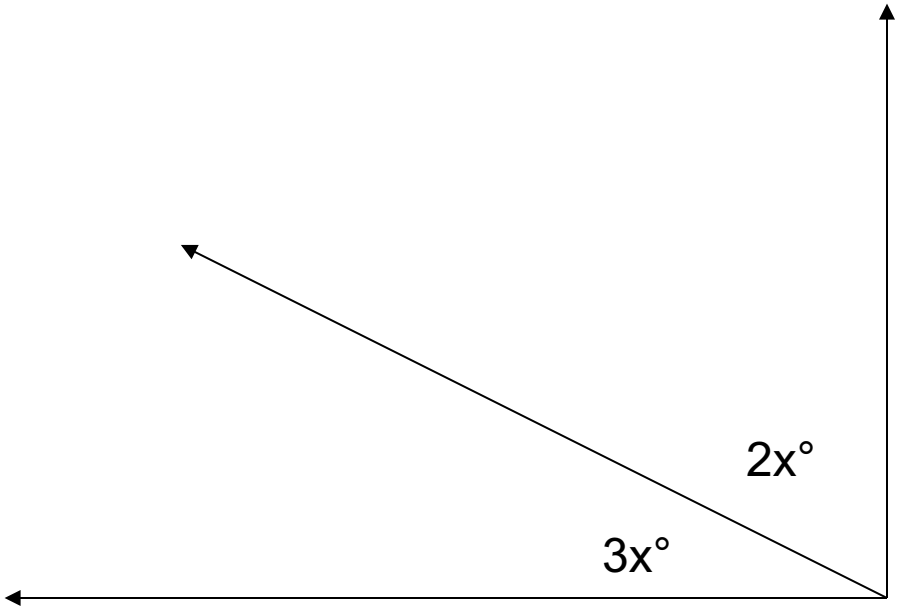


2) Find the missing angle.

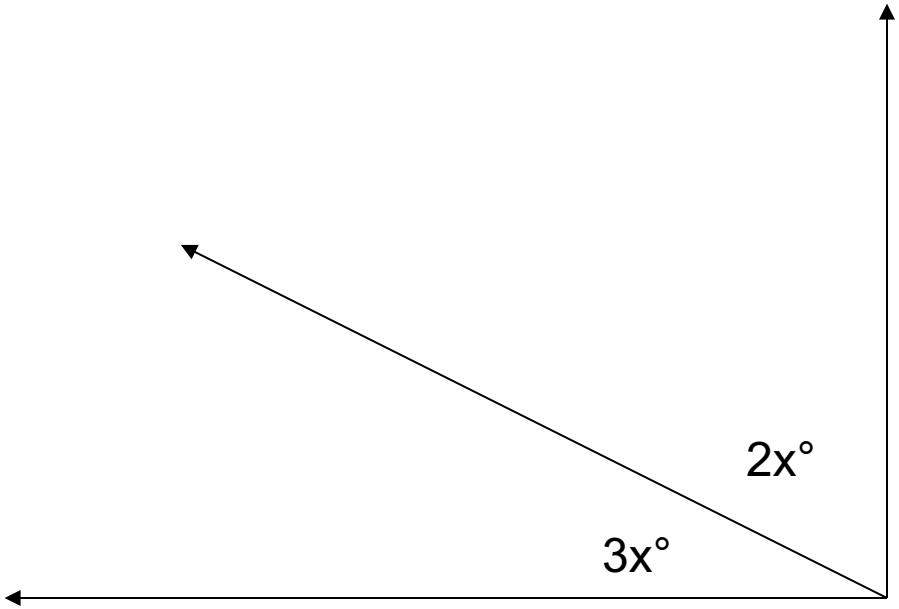


90 ° – 64° = 26°

3) Solve for x.



3) Solve for x.

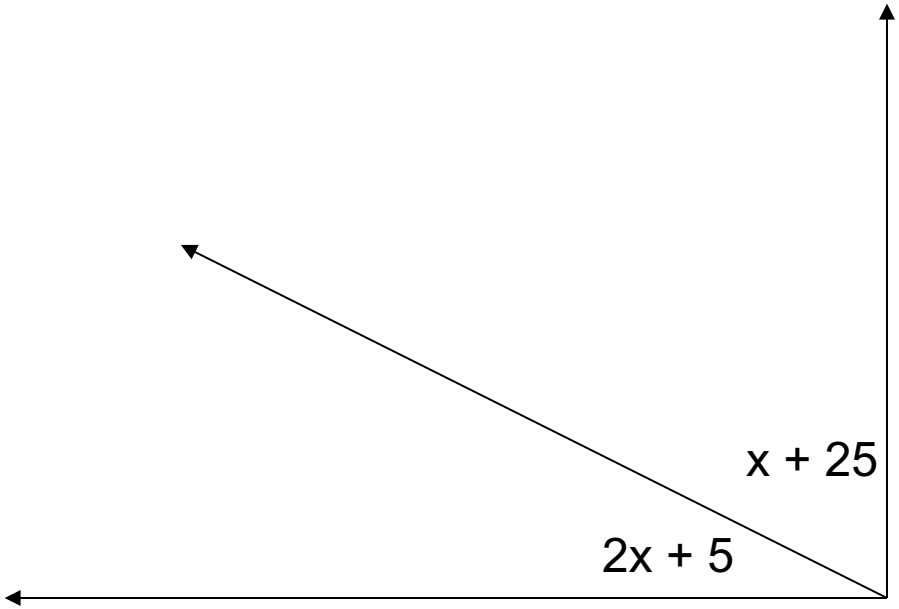


$3x° + 2x° = 90°$

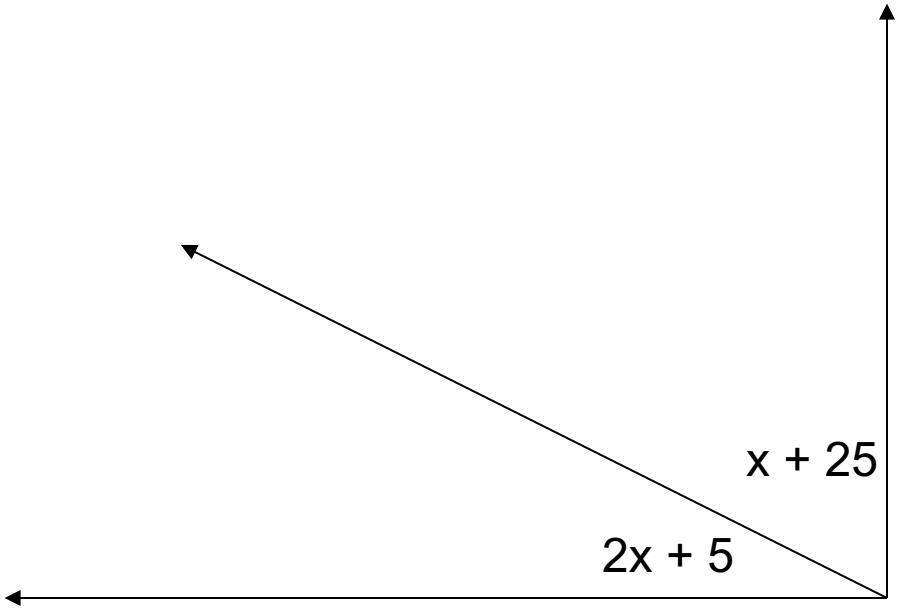
$5x = 90$

$x = 18$

4) Solve for x.



4) Solve for x.



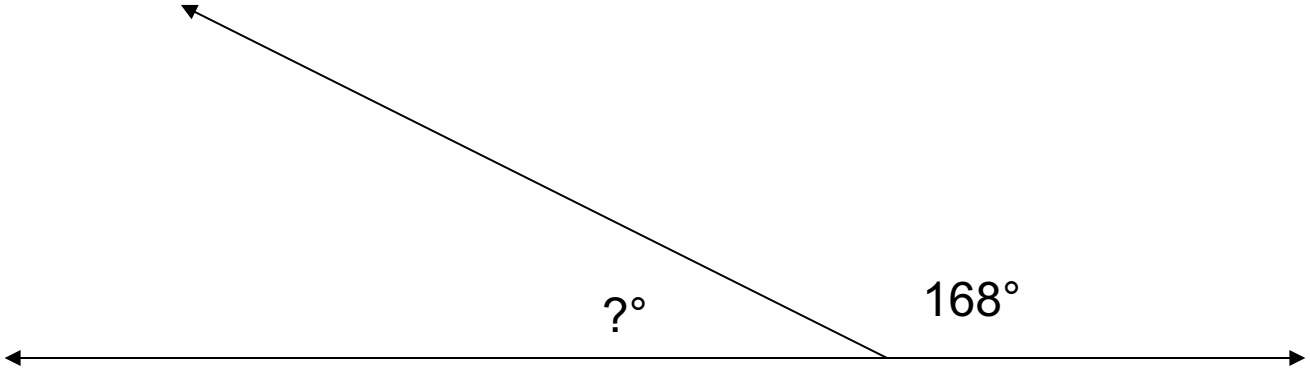
$(2x + 5) + (x + 25) = 90$

$3x + 30 = 90$

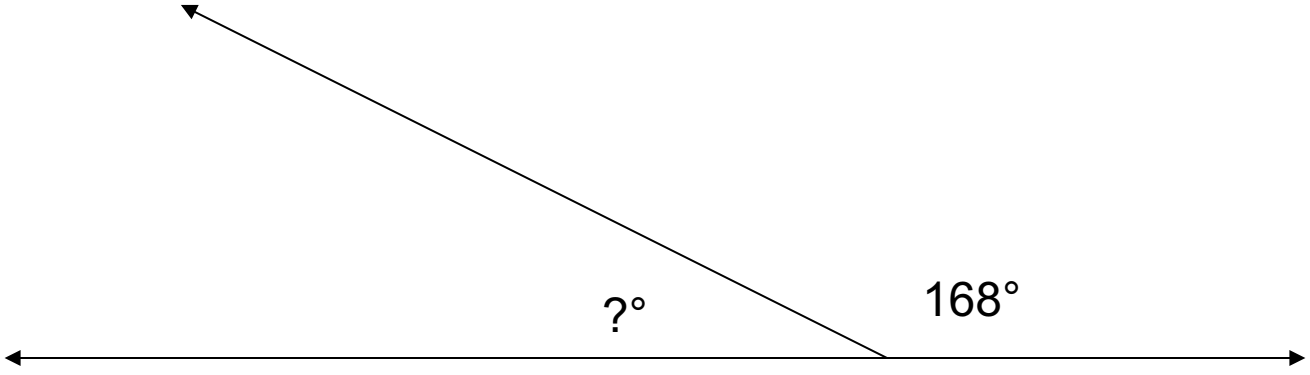
$3x = 60$

$x = 20$

5) Find the missing angle.

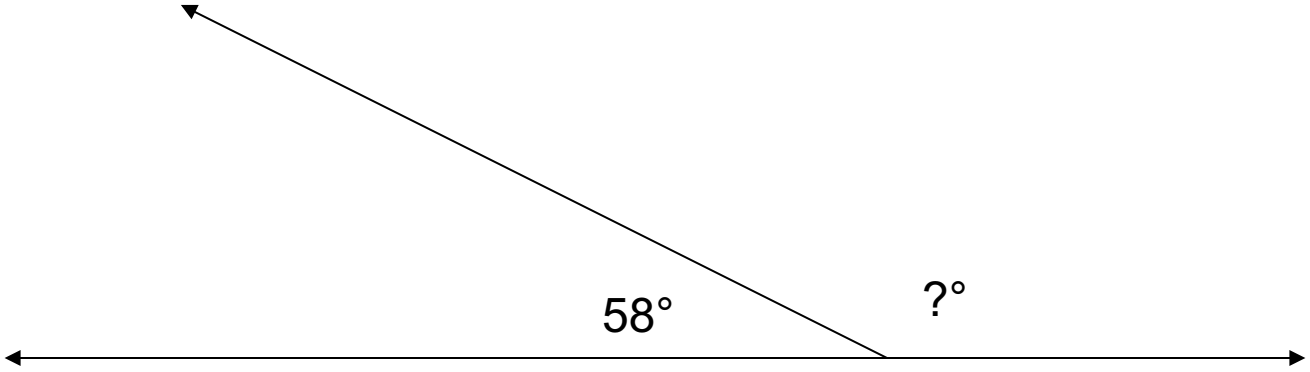


5) Find the missing angle.

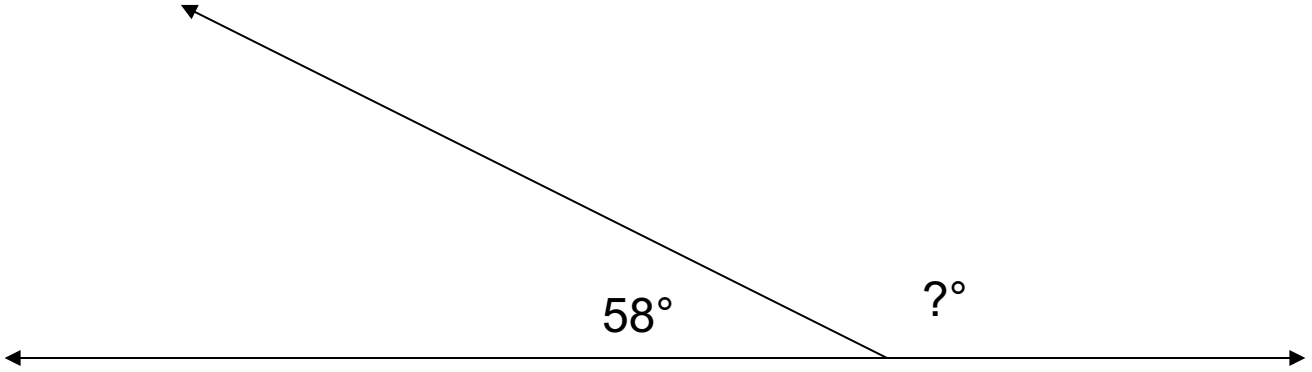


180° – 168° = 12°

6) Find the missing angle.

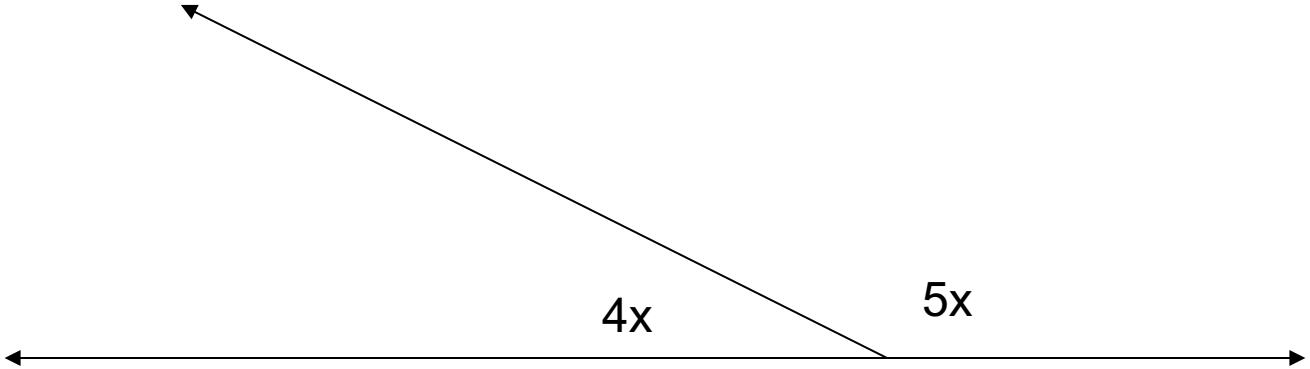


6) Find the missing angle.

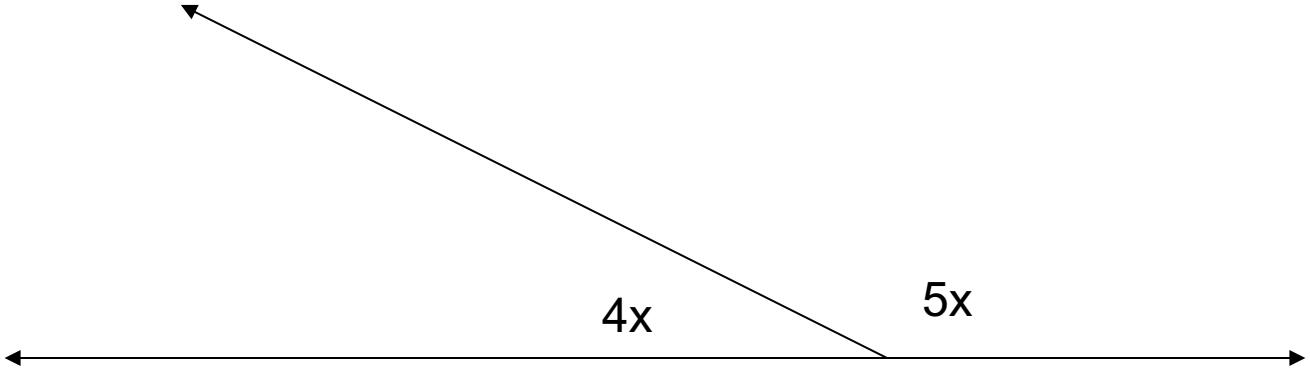


180° – 58° = 122°

7) Solve for x.



7) Solve for x.

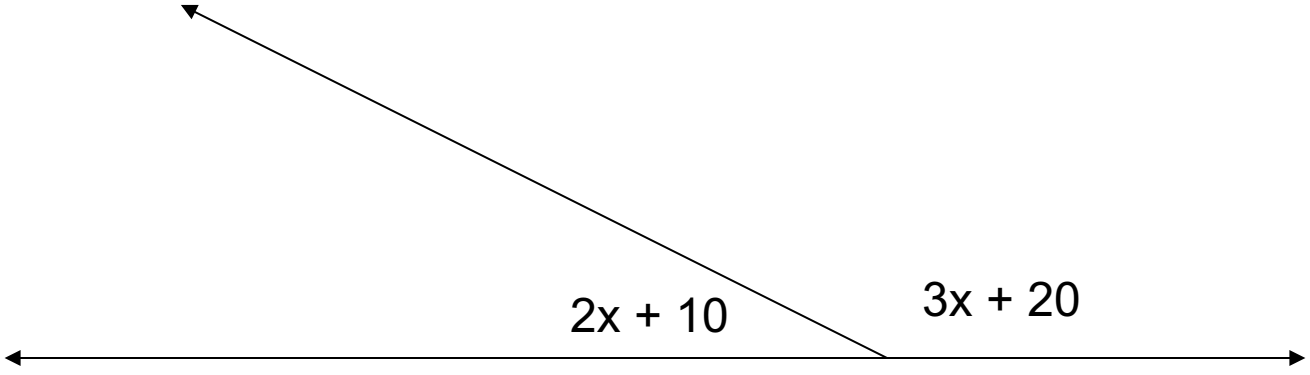


$4x + 5x = 180$

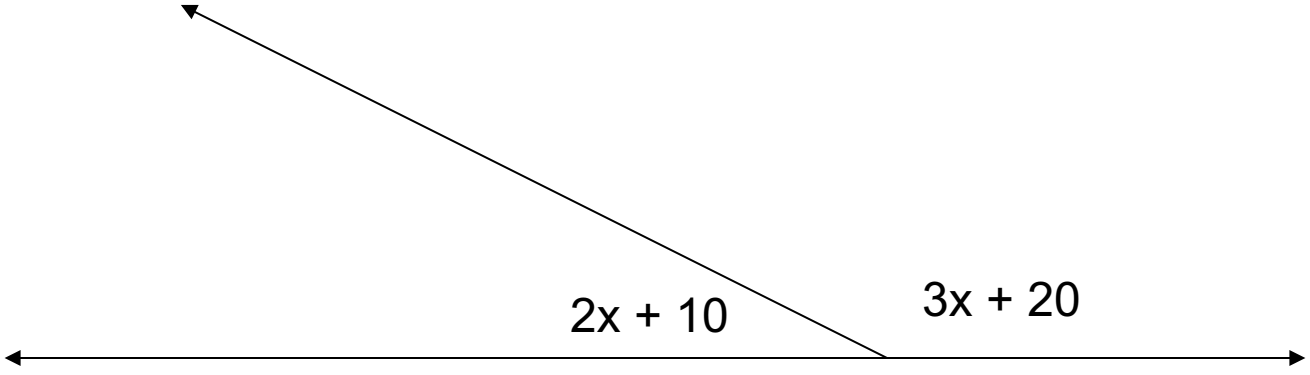
$9x = 180$

$x = 20$

8) Solve for x.



8) Solve for x.



$(2x + 10) + (3x + 20) = 180$

$5x + 30 = 180$

$5x = 150$

$x = 30$

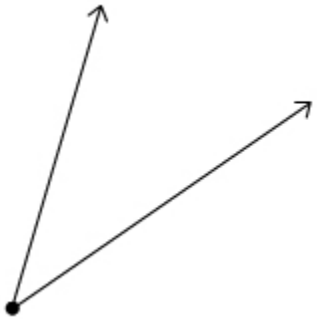
6. Identify the type of the given angle.

A. acute

B. obtuse

C. right

D. straight



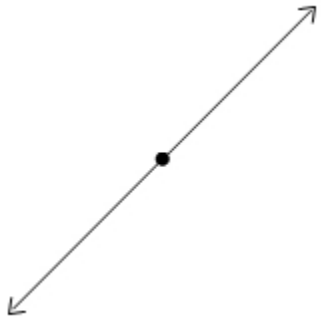
7. Identify the type of the given angle.

A. acute

B. obtuse

C. right

D. straight



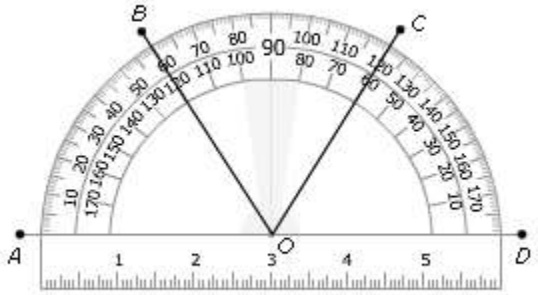
8. Use the diagram to identify the type of the given pair of angles. m∠*AOB* and m∠*BOD*

A. complementary

B. supplementary

C. right

D. none



9. Angles A and B are complementary. If $m\angle A$ is $36°$, what is $m\angle B$?

A. $54°$

B. $90°$

C. $126°$

D. $144°$

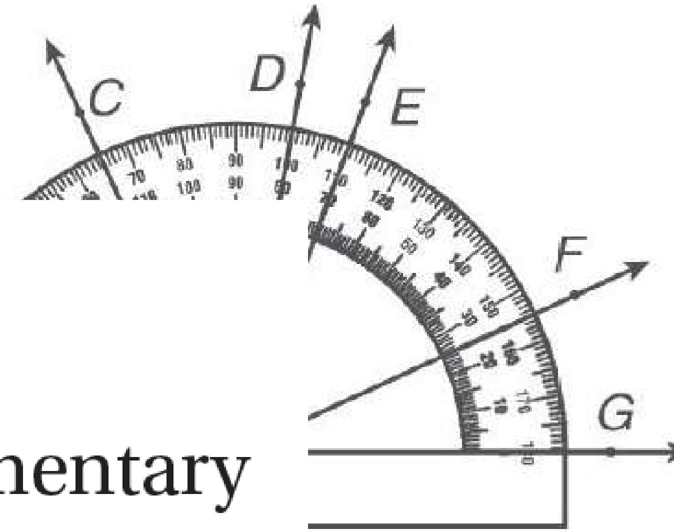
Start your homework

Day 2

Homework Review

Tell whether each angle is acute, right, obtuse, or straight.

1. straight
2. acute
3. obtuse
4. supplementary
5. neither
6. complementary
7. neither
8. complementary
9. 143°
10. 26°
11. 97°
12. 49°



cute

upplementary

5. neither
6. complementary
7. neither
8. complementary
9. 143°
10. 26°
11. 97°
12. 49°

m∠W is 37°,

m∠S is 64°,

m∠C is 83°,

m∠U is 41°,

11-2 Lines and Angle relationships

Vocabulary

perpendicular lines

parallel lines

skew lines

adjacent angles

vertical angles

transversal

When lines, segments, or rays intersect, they form angles. If the angles formed by two intersecting lines measure 90°, the lines are **perpendicular lines**.

Some lines in the same plane do not intersect at all. These lines are **parallel lines**. Segments and rays that are part of parallel lines are also parallel.

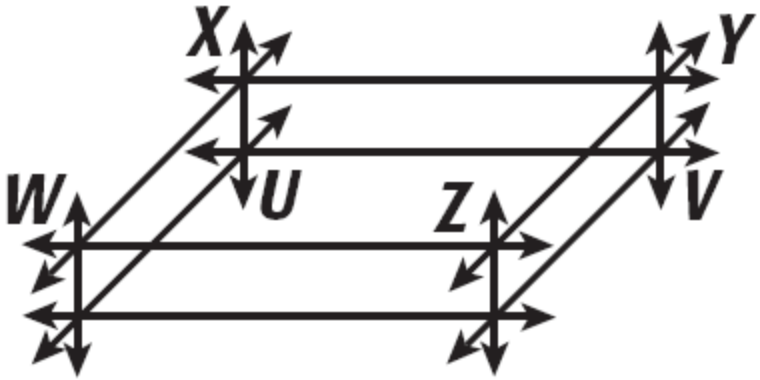
Skew lines do not intersect, and yet they are also not parallel. They lie in different planes.

Reading Math

The symbol $\parallel$ means "is parallel to." The symbol $\perp$ means "is perpendicular to."

Tickets

Tell whether the lines appear parallel, perpendicular, or skew.

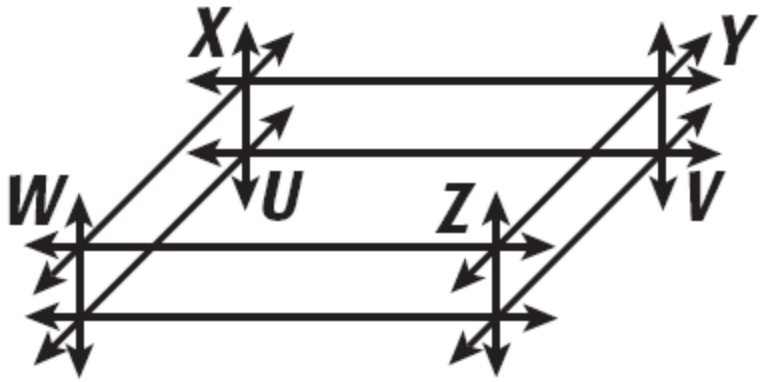


$\overleftrightarrow{UV}$ **and** $\overleftrightarrow{YV}$

$\overleftrightarrow{UV} \perp \overleftrightarrow{YV}$

The lines appear to intersect to form right angles.

Tell whether the lines appear parallel, perpendicular, or skew.

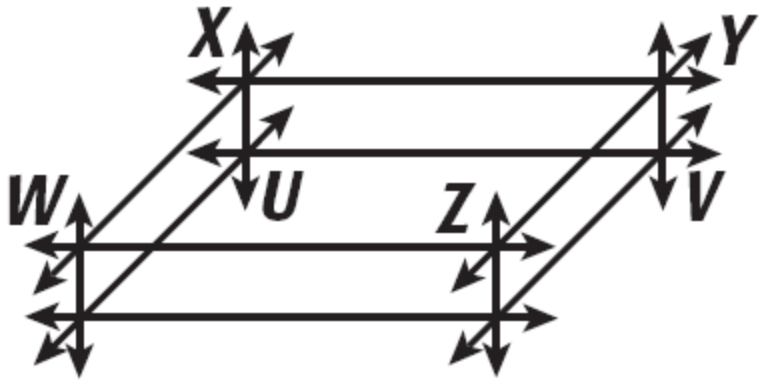


$\overleftrightarrow{XU}$ and $\overleftrightarrow{WZ}$

$\overleftrightarrow{XU}$ and $\overleftrightarrow{WZ}$ are skew.

The lines are in different planes and do not intersect.

Tell whether the lines appear parallel, perpendicular, or skew.

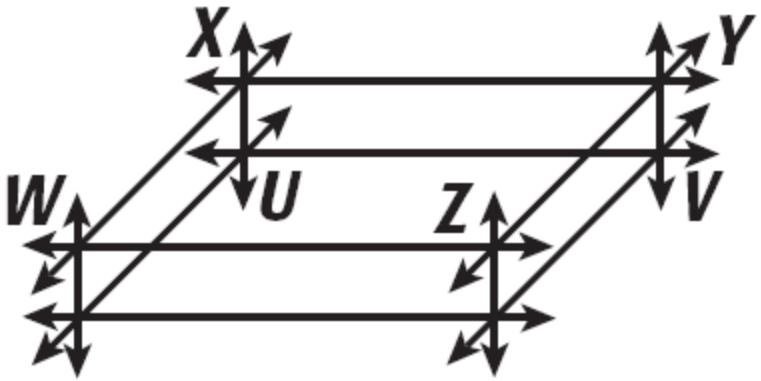


$\overleftrightarrow{XY}$ **and** $\overleftrightarrow{WZ}$

$\overleftrightarrow{XY} \parallel \overleftrightarrow{WZ}$

The lines are in the same plane and do not intersect.

Tell whether the lines appear parallel, perpendicular, or skew.

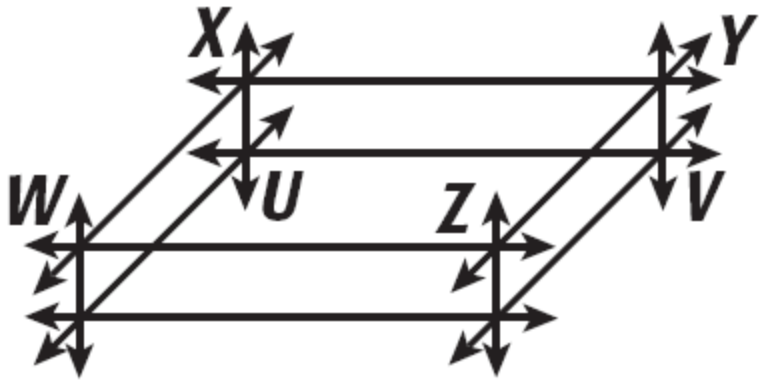


$\overleftrightarrow{WX}$ **and** $\overleftrightarrow{XU}$

$\overleftrightarrow{WX} \perp \overleftrightarrow{XU}$

The lines appear to intersect to form right angles.

Tell whether the lines appear parallel, perpendicular, or skew.

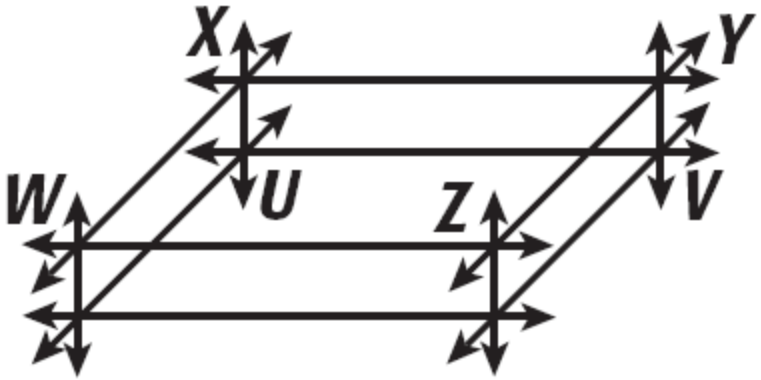


$\overleftrightarrow{WX}$ and $\overleftrightarrow{UV}$

$\overleftrightarrow{WX}$ and $\overleftrightarrow{UV}$ are skew.

The lines are in different planes and do not intersect.

Tell whether the lines appear parallel, perpendicular, or skew.



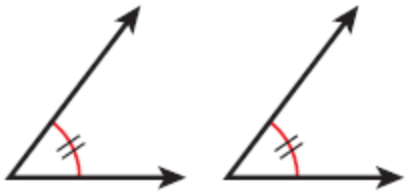
$\overleftrightarrow{WX}$ **and** $\overleftrightarrow{ZY}$

$\overleftrightarrow{WX} \parallel \overleftrightarrow{ZY}$

The lines are in the same plane and do not intersect.

Reading Math

Angles with the same number of tick marks are congruent. The tick marks are placed in the arcs drawn inside the angles.



A **transversal** is a line that intersects two or more lines. Transversals to parallel lines form special angle pairs.

Rest of class:

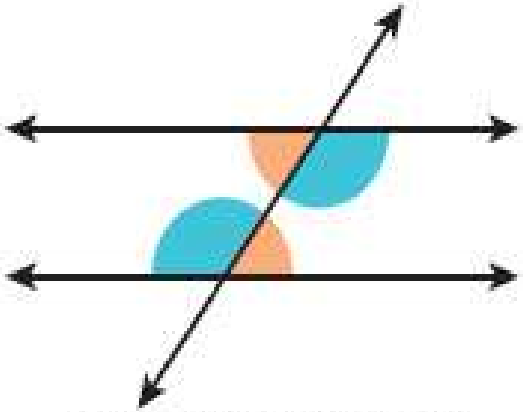
1. Complete transversal lab
2. Get teacher signoff
3. Individually Complete classwork .
4. Get teacher sign off
5. Complete homework

Video Review

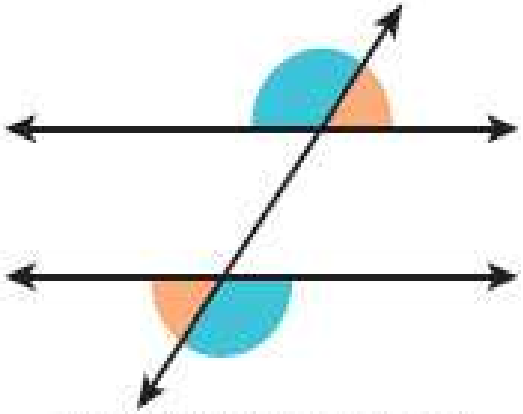
http://www.shmoop.com/video/parallel-lines-transversals/

Day 3

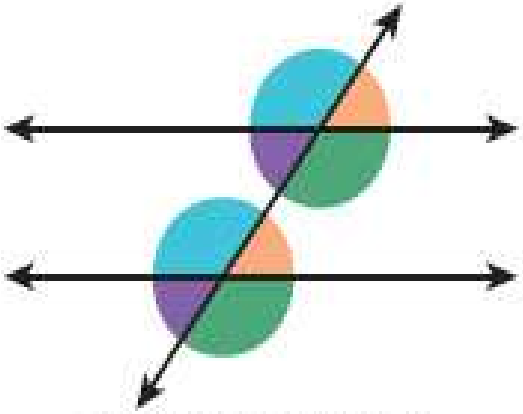
A **transversal** is a line that intersects two or more lines. Transversals to parallel lines form special angle pairs.



Alternate interior angles



Alternate exterior angles



Corresponding angles

PROPERTIES OF TRANSVERSALS TO PARALLEL LINES

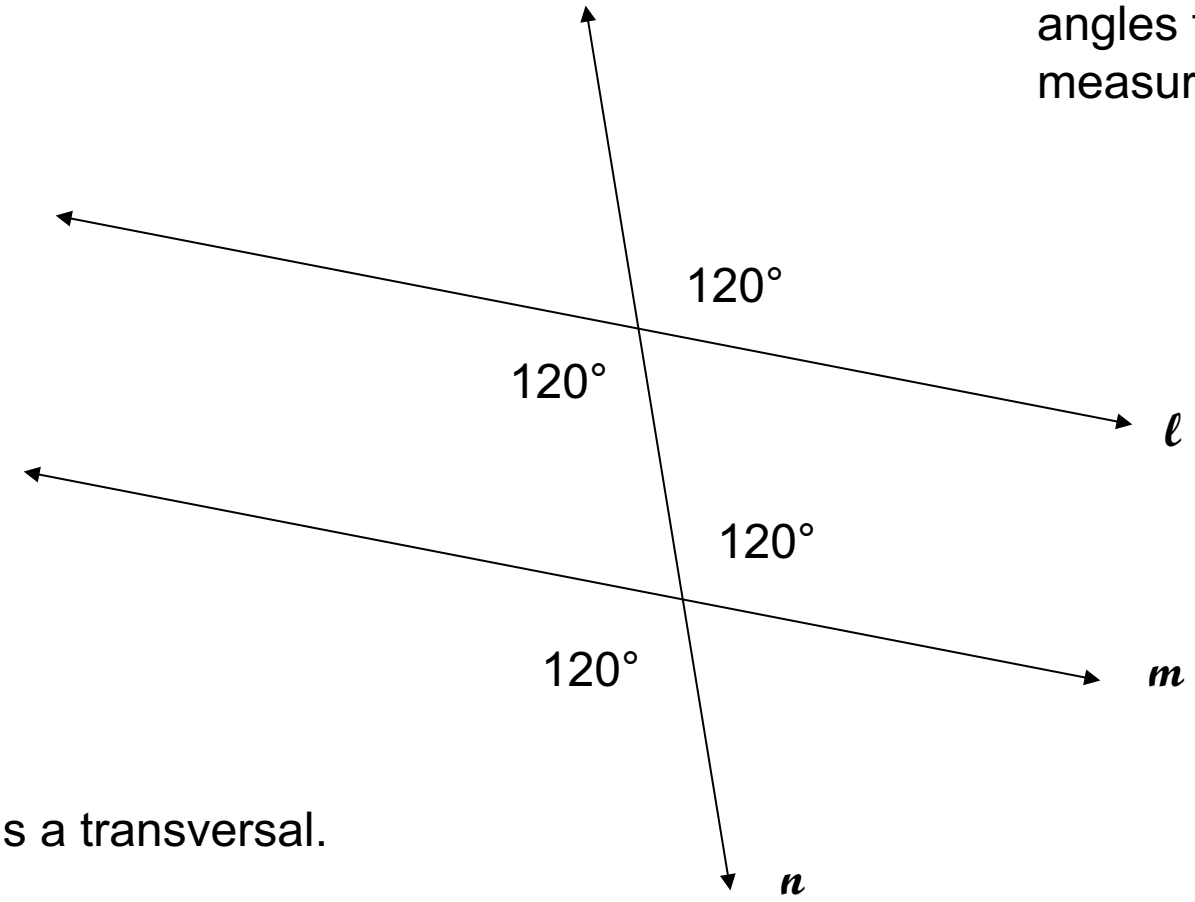
If two parallel lines are intersected by a transversal,

- corresponding angles are congruent,
- alternate interior angles are congruent,
- and alternate exterior angles are congruent.

Lines ℓ and m are parallel.

$\ell \| m$

Note the 4 angles that measure 120°.

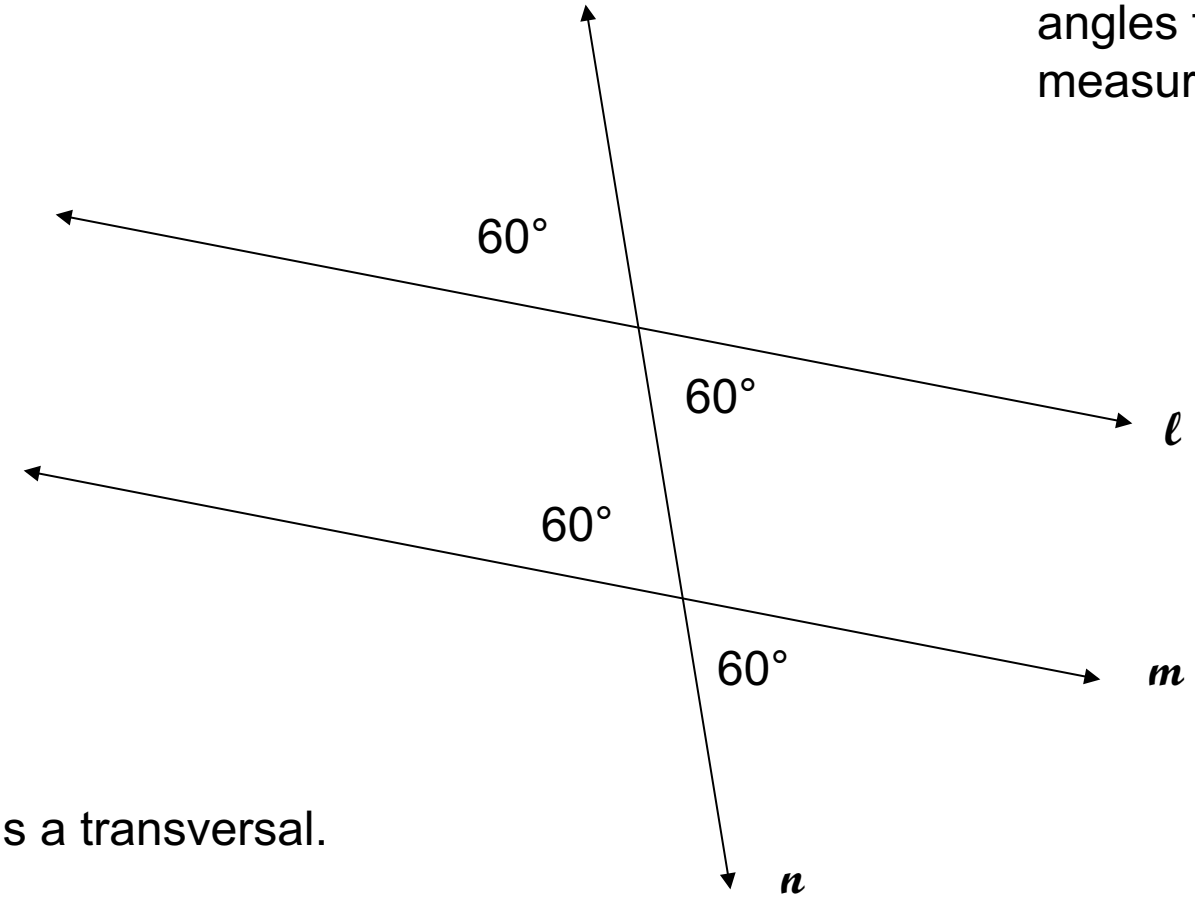


Line n is a transversal.

Lines ℓ and m are parallel.

$\ell \| m$

Note the 4 angles that measure 60°.



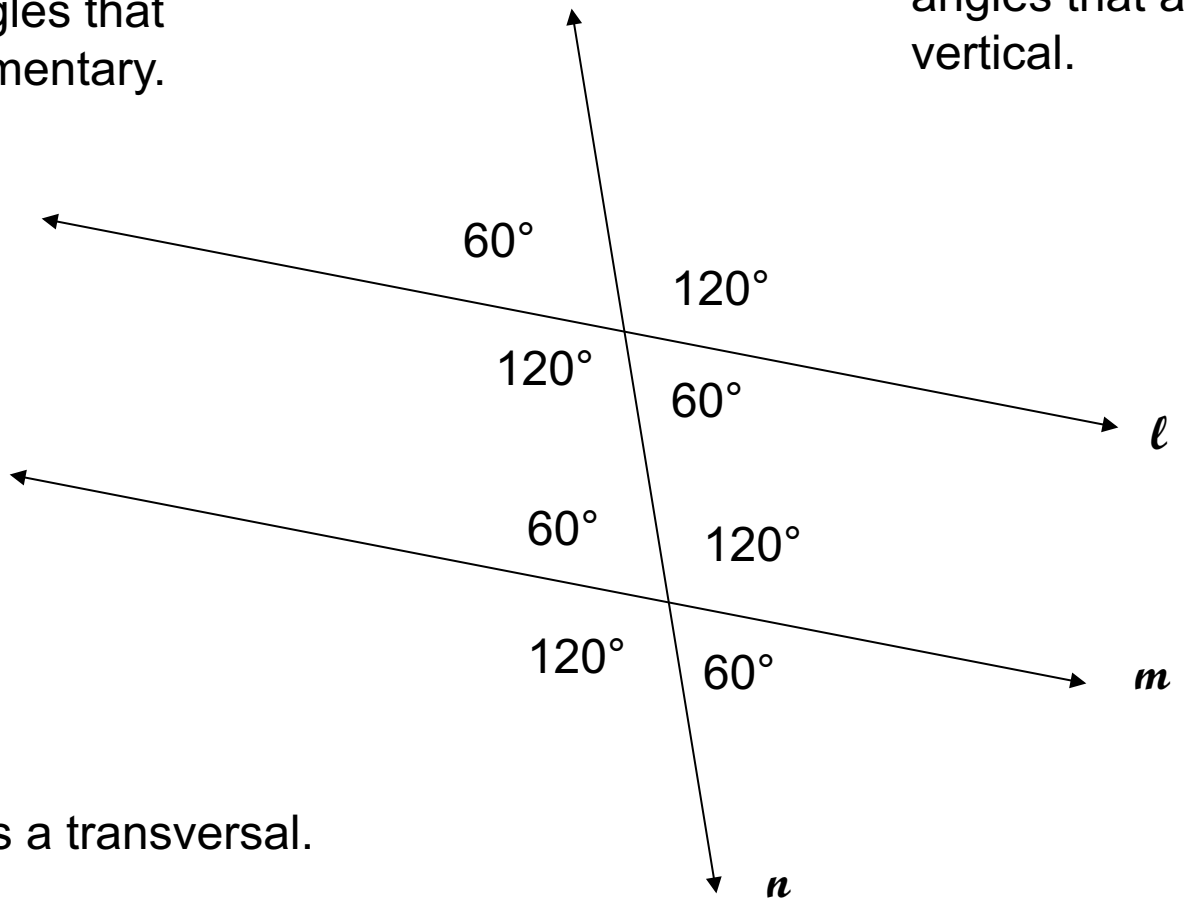
Line n is a transversal.

Lines ℓ and m are parallel.

$\ell \| m$

There are many pairs of angles that are supplementary.

There are 4 pairs of angles that are vertical.



Line n is a transversal.

Warm up

In the figure *a* || *b*.

1. Name the angles congruent to ∠3.

∠1, ∠5, ∠7

2. Name all the angles supplementary to ∠6.

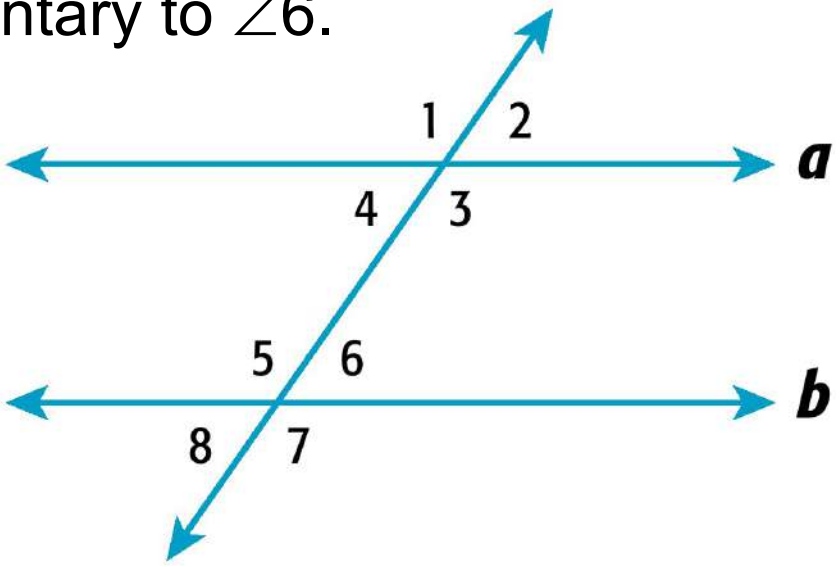
∠1, ∠3, ∠5, ∠7

3. If m∠1 = 105° what is m∠3?

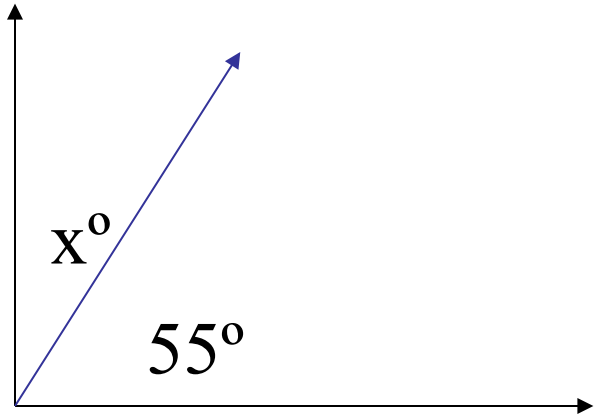
105°

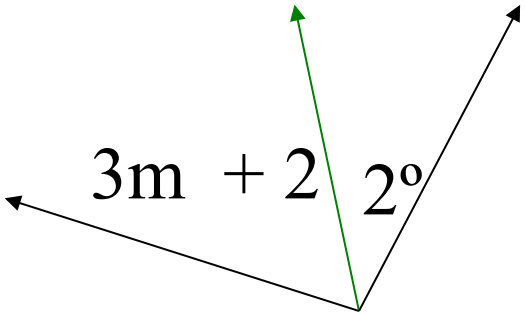
4. If m∠5 = 120° what is m∠2?

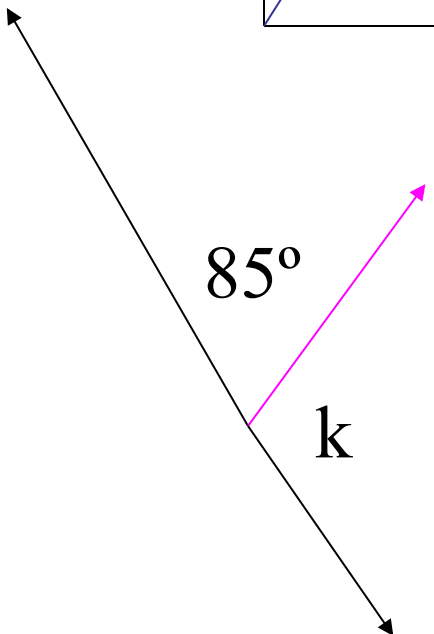
60°

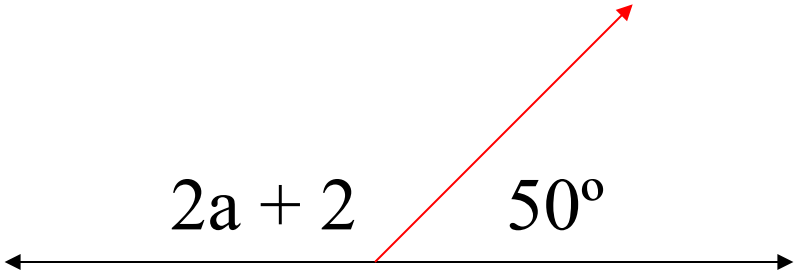


Review
Solve.









Toothpic Vocabulary