

# Geometry Unit 2: Angles

Bronx Early College Academy

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28 September - 7 October 2022

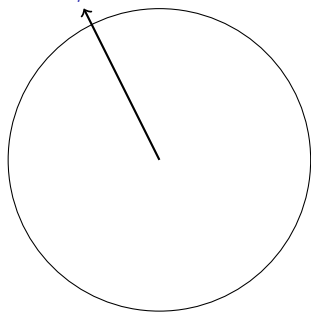
2.1 Angle notation, measures	28 September
2.2 Angle addition	29 September
2.3 Angle pairs	30 September
2.4 Angle bisectors	3 October
2.5 Triangle sum; equilateral, isosceles $\triangle$ angles	4 October
2.6 Review	6 October
2.7 Test: Angle measures	7 October
Open Middle: complementary and supplementary puzzle	

# Learning Target: I can measure angles

CCSS: HSG.CO.A.1 Know precise geometric definitions

2.1 Wednesday 28 Sept

Do Now: On the clock face, which is more time, from the 1 to the 3, or from the 11 to the 2? (insert clock image)

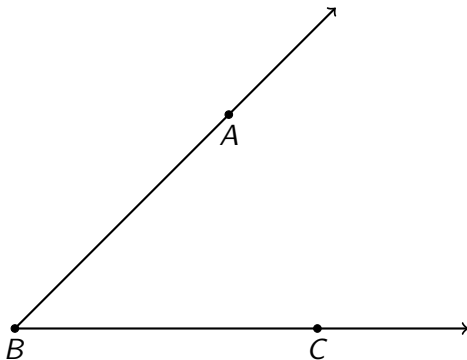


1. Write down an equation to represent the situation.

Lesson: Angle measures, internal, external, acute, obtuse, right

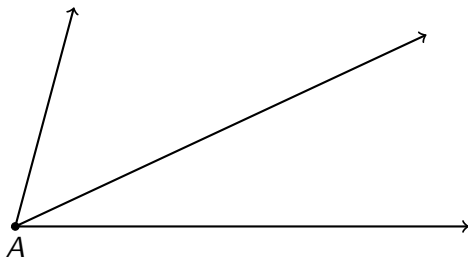
Angle: two rays with a common endpoint or vertex

Rays  $\overrightarrow{BA}$  and  $\overrightarrow{BC}$ . Vertex  $B$ . Written notation is  $\angle ABC$  or  $\angle B$ .



## Angle measures: the Babylonian system of $360^\circ$ in a circle

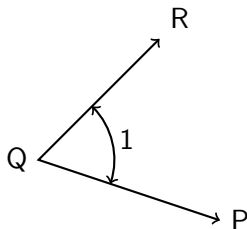
- ▶ A full rotation is  $360^\circ$  (a full “turn”).
- ▶ A half turn (straight line) is  $180^\circ$ .
- ▶  $90^\circ$  is a quarter turn or a *right* angle.
- ▶ *Acute* angles measure less than  $90^\circ$ . *Obtuse* angles measure more than  $90^\circ$ .
- ▶ *Adjacent* angles (“next to” each other) share a common ray and are external to each other.



# Write definitions in your notebook

## Angle terminology and notation

1. *Right angles* measure  $90^\circ$
2. *Perpendicular* lines meet at right angles.  $\overline{AB} \perp \overline{CD}$
3. *Acute* angles are  $< 90^\circ$
4. *Obtuse* angles are  $90^\circ < \angle m < 180^\circ$
5. A *straight line* or angle measures  $180^\circ$



Point  $Q$  is the *vertex*

The sides or *legs* are  $\overrightarrow{QR}$ ,  $\overrightarrow{QP}$

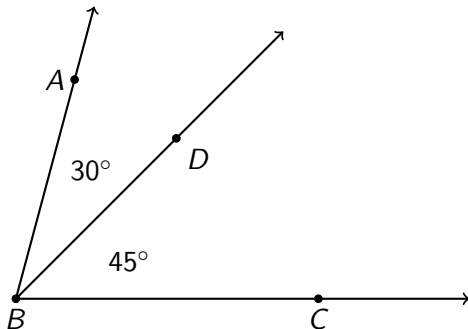
Written  $\angle 1$ ,  $\angle Q$ , or  $\angle PQR$

# Learning Target: I can solve for angle measures

CCSS: HSG.CO.A.1 Know precise geometric definitions

2.2 Thursday 29 Sept

Do Now:  $m\angle ABD = 30^\circ$ ,  $m\angle DBC = 45^\circ$ . Find  $m\angle ABC$ .



Lesson: Angle addition problems, vertical angles

## Angle addition postulate

For adjacent angles, the sum of their measures is the measure of their combined angle.

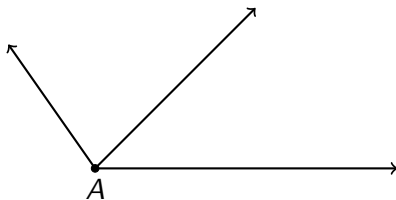
Special pairs of angles [make a new slide]

A *linear pair* are two angles that make a straight line.

*Opposite rays* have a common endpoint and make a line. (They form an angle measuring  $180^\circ$ ).

Angles whose measures sum to  $180^\circ$  are *supplementary*.

Angles whose measures sum to  $90^\circ$  are *complementary*.



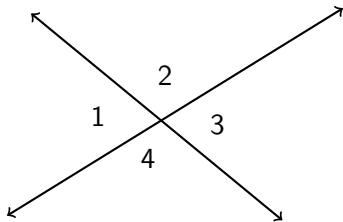


## Learning Target: I can identify vertical angles

CCSS: HSG.CO.A.1 Know precise geometric definitions

2.3 Friday 30 September

Definition: *Vertical angles* are angles opposite each other when two lines intersect.  $\angle 1$  and  $\angle 3$  are vertical angles, as are  $\angle 2$  and  $\angle 4$ .

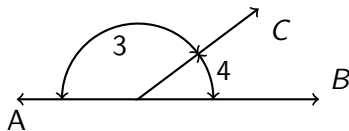
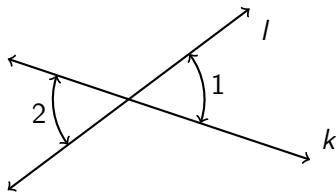


Lesson: Angle addition problems, vertical angles

# Write down definitions in your notebook

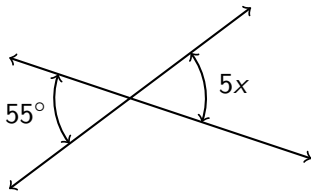
## Angle pairs

1. *Adjacent* angles share a leg (“next to each other”)
2. *Complementary* angles measures sum to  $90^\circ$
3. *Supplementary* angles sum to  $180^\circ$
4. *Vertical* or opposite angles made by intersecting lines (1, 2)
5. *Linear pairs*, adjacent angles making a straight line (3, 4)



## Angle pairs: check your knowledge

1. *Complementary* angles sum to how many degrees?
2. *Supplementary* angles sum to how many degrees?
3. Given complementary angles  $\angle A$  and  $\angle B$  with  $m\angle A = 30^\circ$ . Find  $m\angle B$ .
4. Given  $m\angle A = 100^\circ$  and  $m\angle B = 2x$ . Find  $x$  such that angles  $\angle A$  and  $\angle B$  are supplementary.
5. Given vertical angles as shown. Find  $x$ .



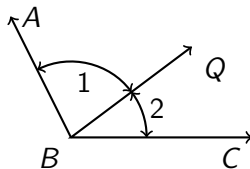
# Write down definitions in your notebook

A postulate is a fundamental statement we agree is true

1. *Scalene* triangles have three unequal sides
2. *Horizontal*, sideways or level
3. *Vertical*, straight up and down
4. An angle's *measure*, it's size, is written  $m\angle$

5. *Angle Addition Postulate*  
Measures of adjacent angles  
sum to the resulting angle

$$m\angle 1 + m\angle 2 = m\angle ABC$$



## Learning Target: I can bisect angles

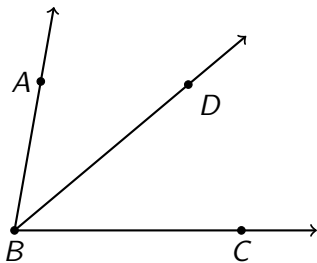
CCSS: HSG.CO.A.1 Know precise geometric definitions

2.4 Monday 3 October

Definition of angle bisector

*Angle bisector*: a ray dividing an angle into two congruent angles.

As shown,  $\overrightarrow{BD}$  bisects  $\angle ABC$  if and only if  $\angle ABD \cong \angle CBD$ .



# Angle relationships

Review: Angle postulates and theorems you have learned.

1.  $\perp$  lines and complementary  $\angle$ s make  $90^\circ$
2. linear pairs add to  $180^\circ$
3. vertical  $\angle$ s are  $\cong$
4. definition of an angle bisector

# Open Middle problem (fun)

Use digits from 0 to 9. Using a digit no more than once.

The first two angle measures are complementary. The second two angles supplementary. (degrees)
