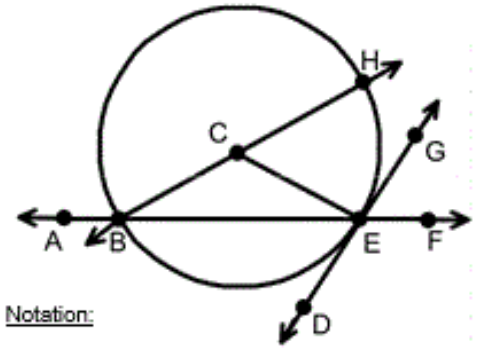
WARM-UP

List examples of each part of a circle.

SUMMING IT ALL UP: Parts of a Circle

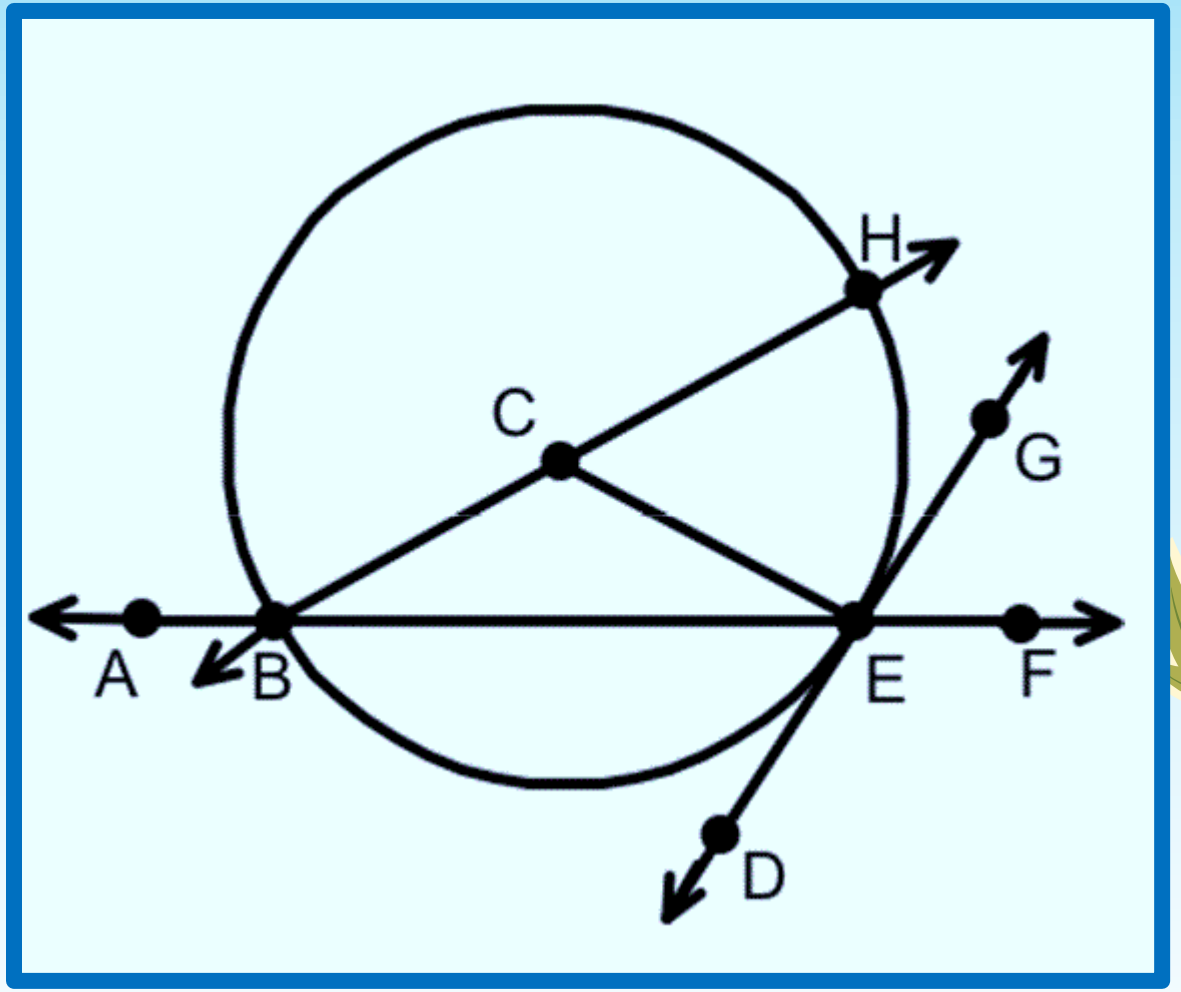
Name, with proper notation, as many terms as you can remember from the lesson. All the blanks may or may not be used.



Term:	Notation:		
Point of Tangency	_____	_____	_____
Radius	_____	_____	_____
Diameter	_____	_____	_____
Chord	_____	_____	_____
Secant	_____	_____	_____
Tangent	_____	_____	_____
Central Angle	_____	_____	_____
Inscribed Angle	_____	_____	_____
Minor Arc	_____	_____	_____
Major Arc	_____	_____	_____
Semicircle	_____	_____	_____

Point of Tangency

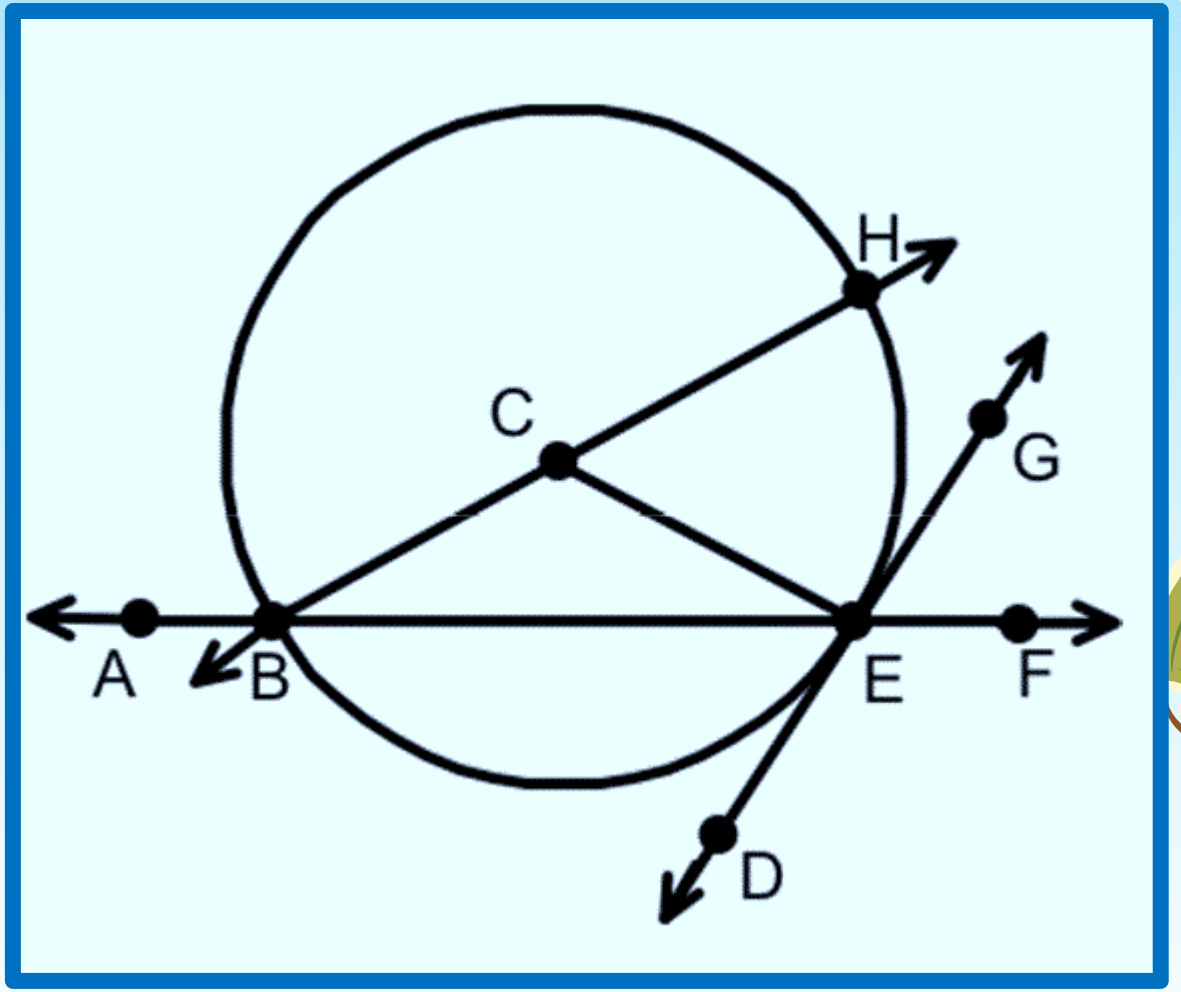
Point E



Radius

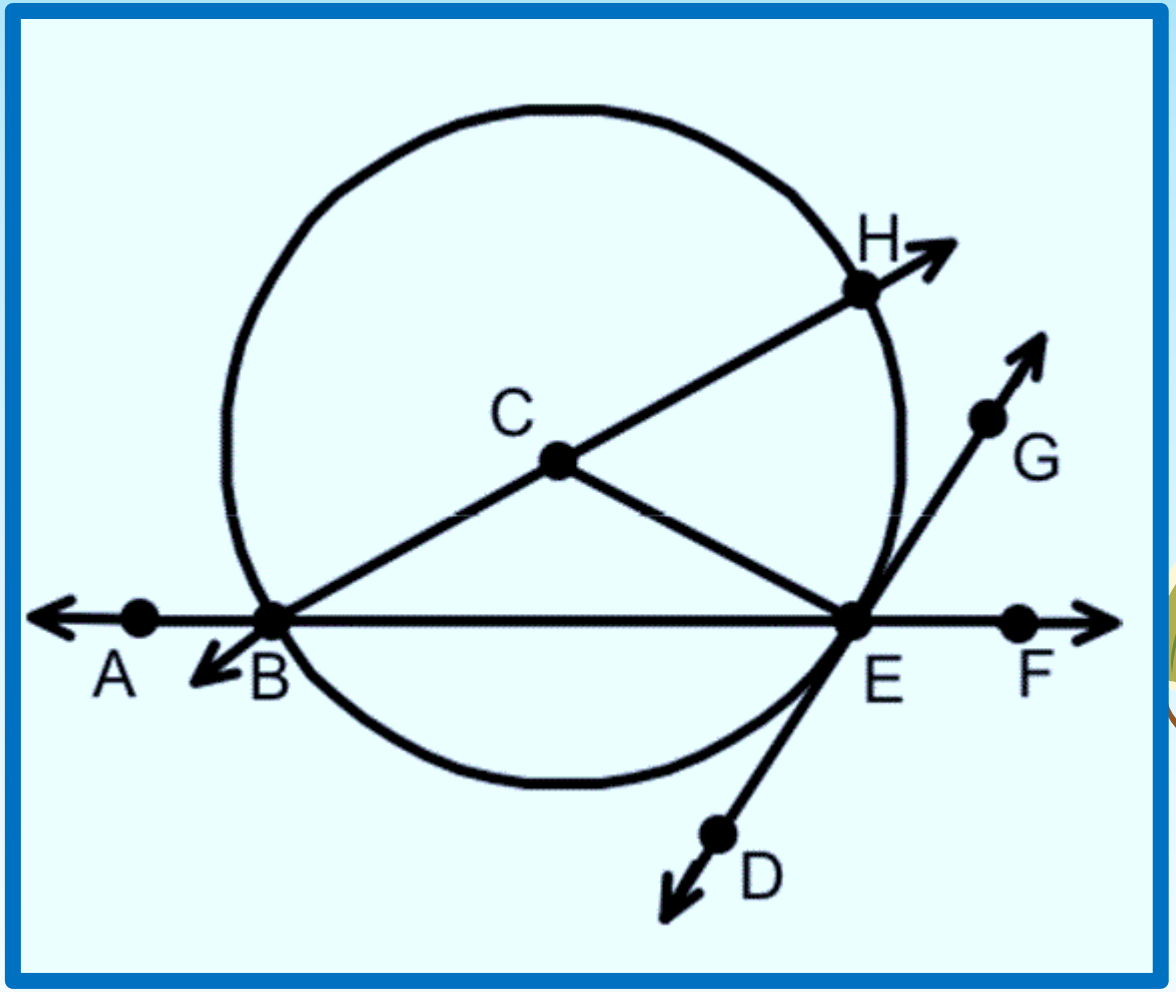
$\overline{CH}$ $\overline{CB}$

$\overline{CE}$



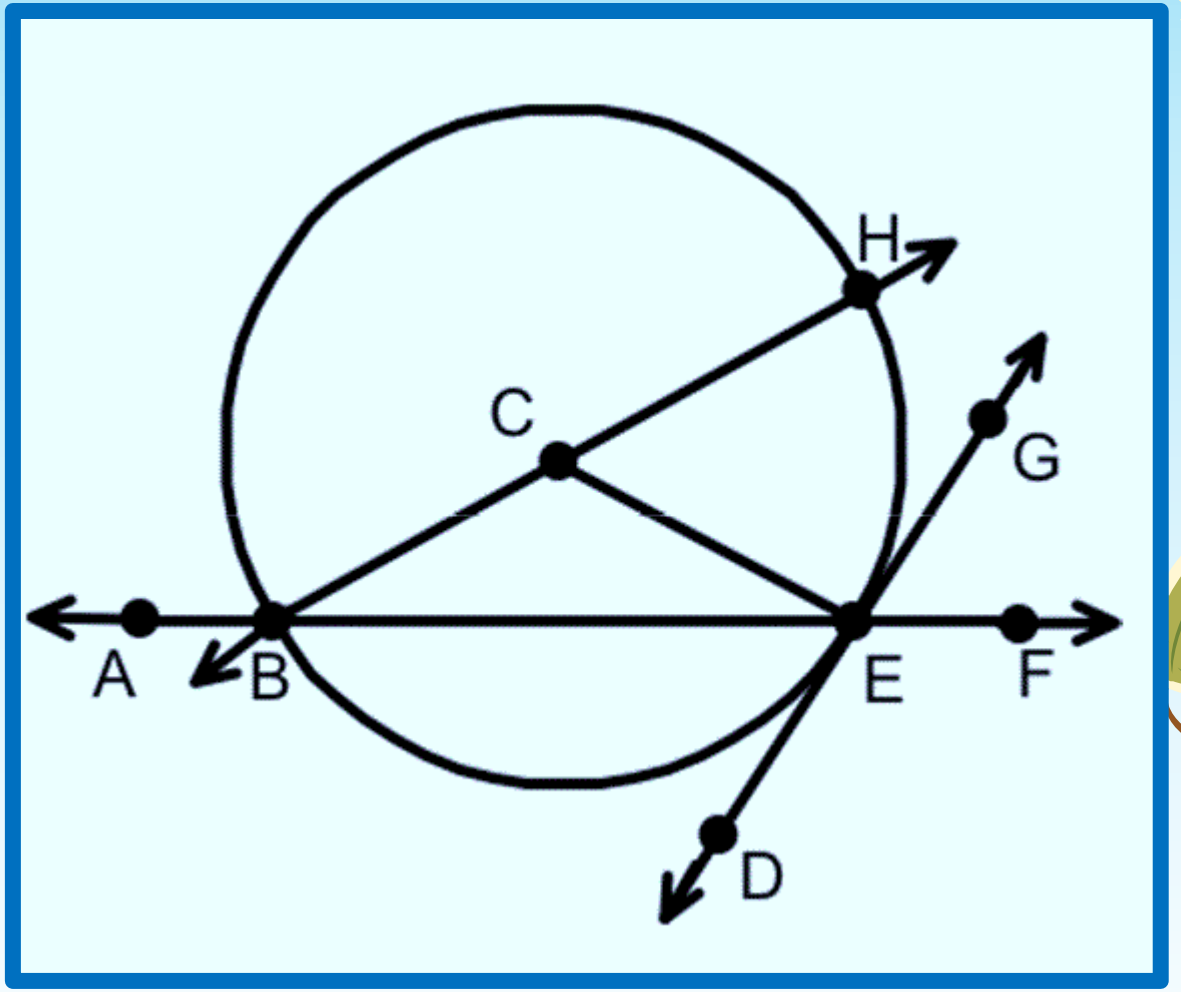
Diameter

$\overline{BH}$



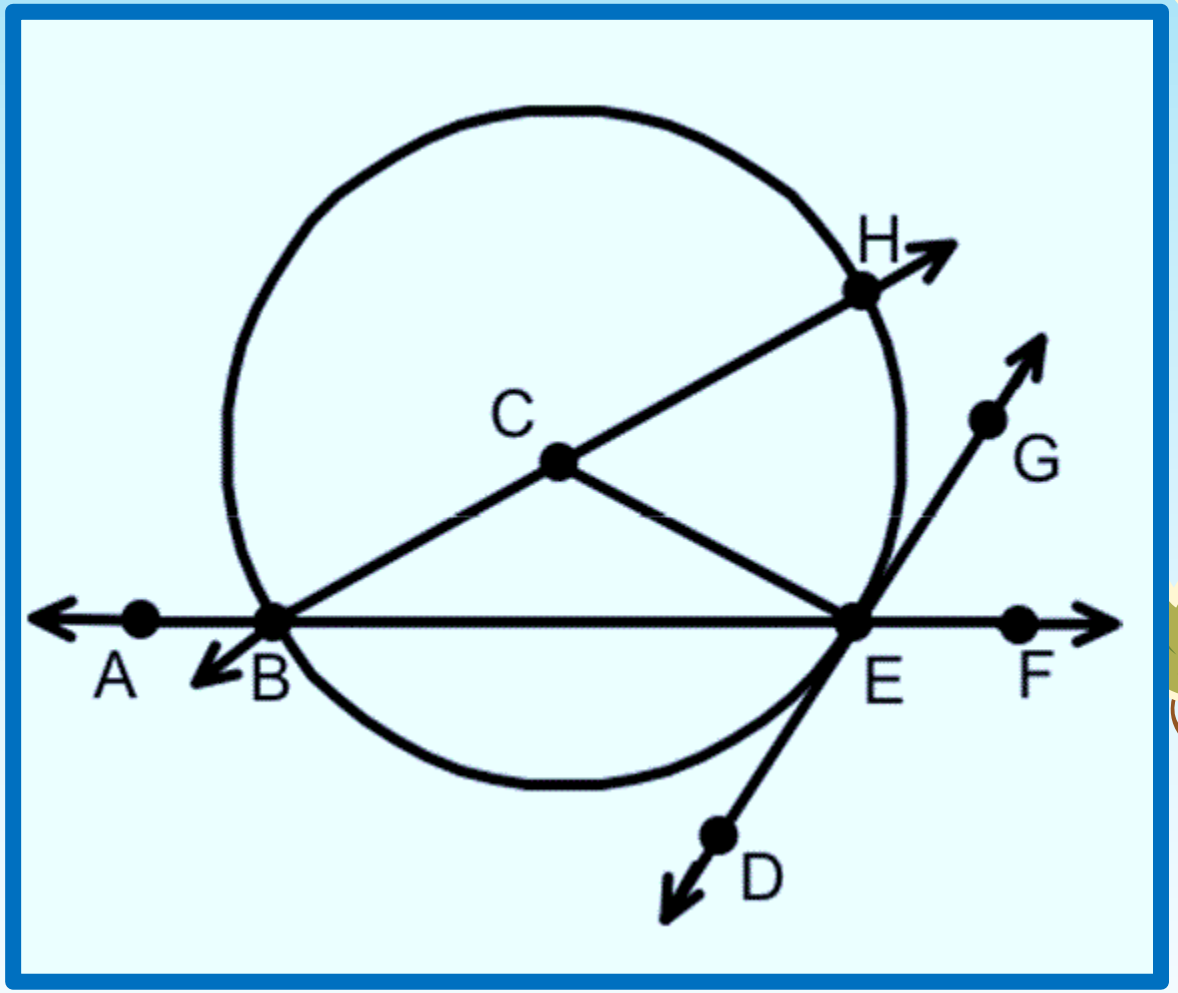
Chord

$\overline{BE}$



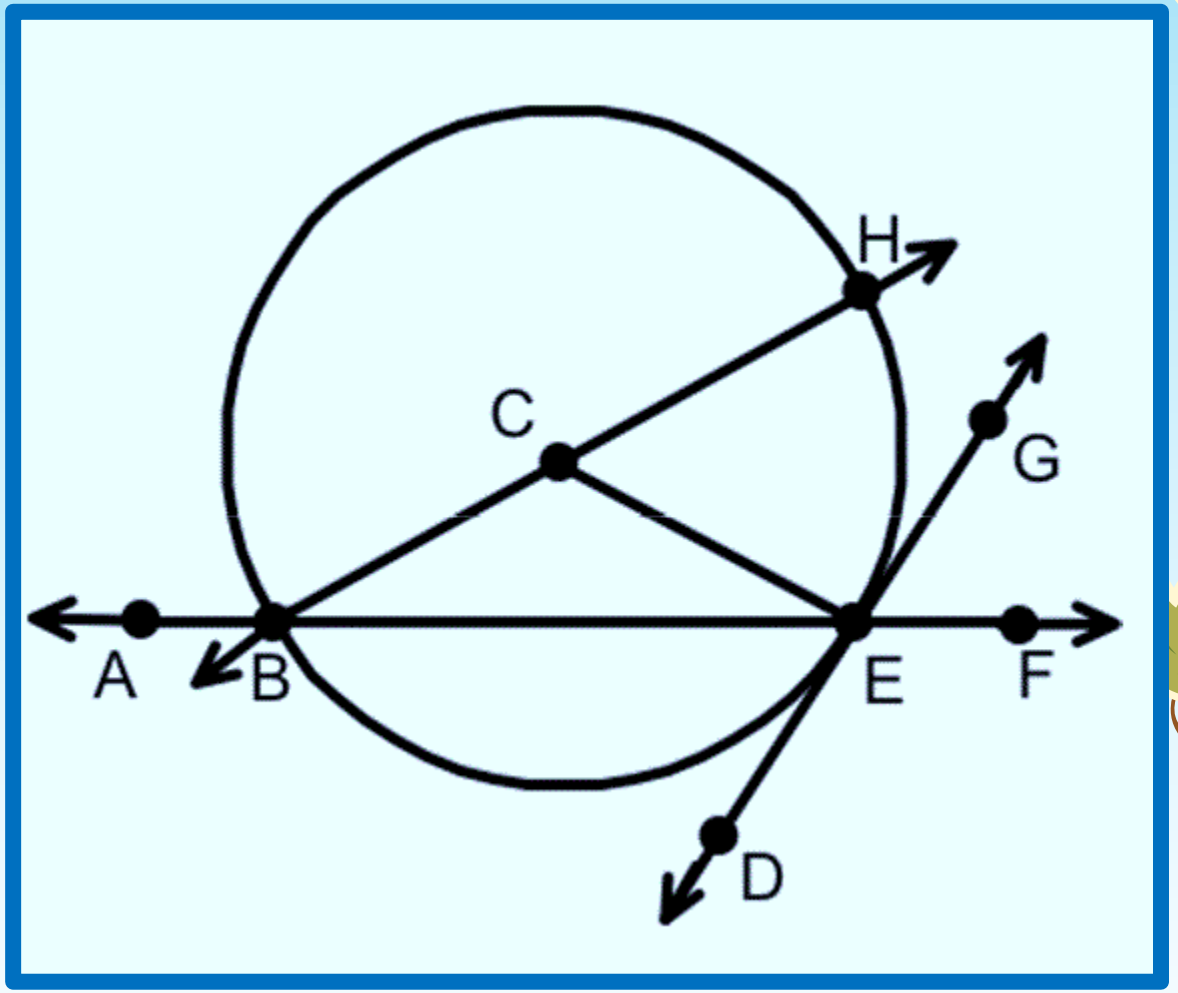
Secant

$\overleftrightarrow{AF}$



Tangent

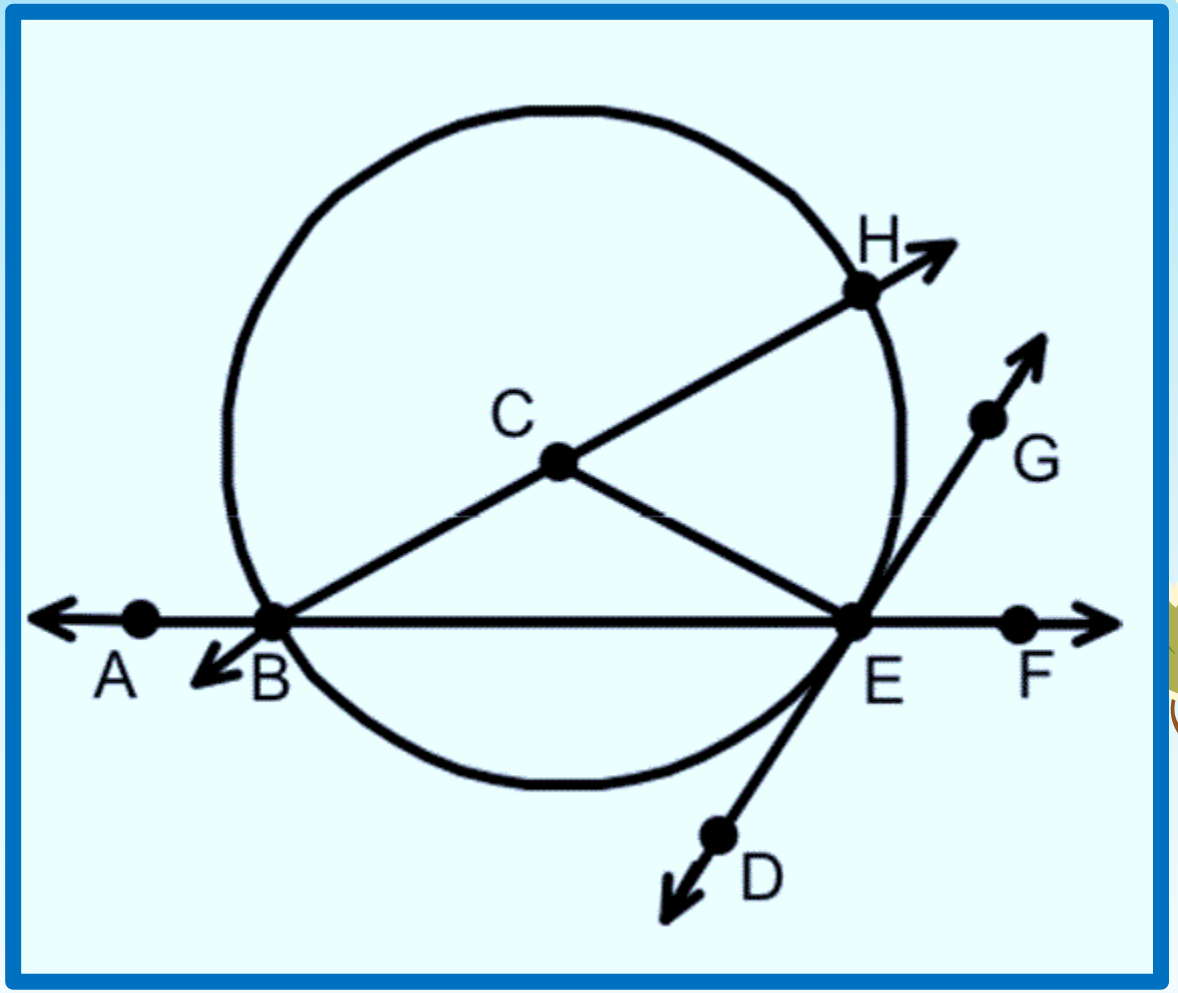
$\overleftrightarrow{DG}$



Central Angle

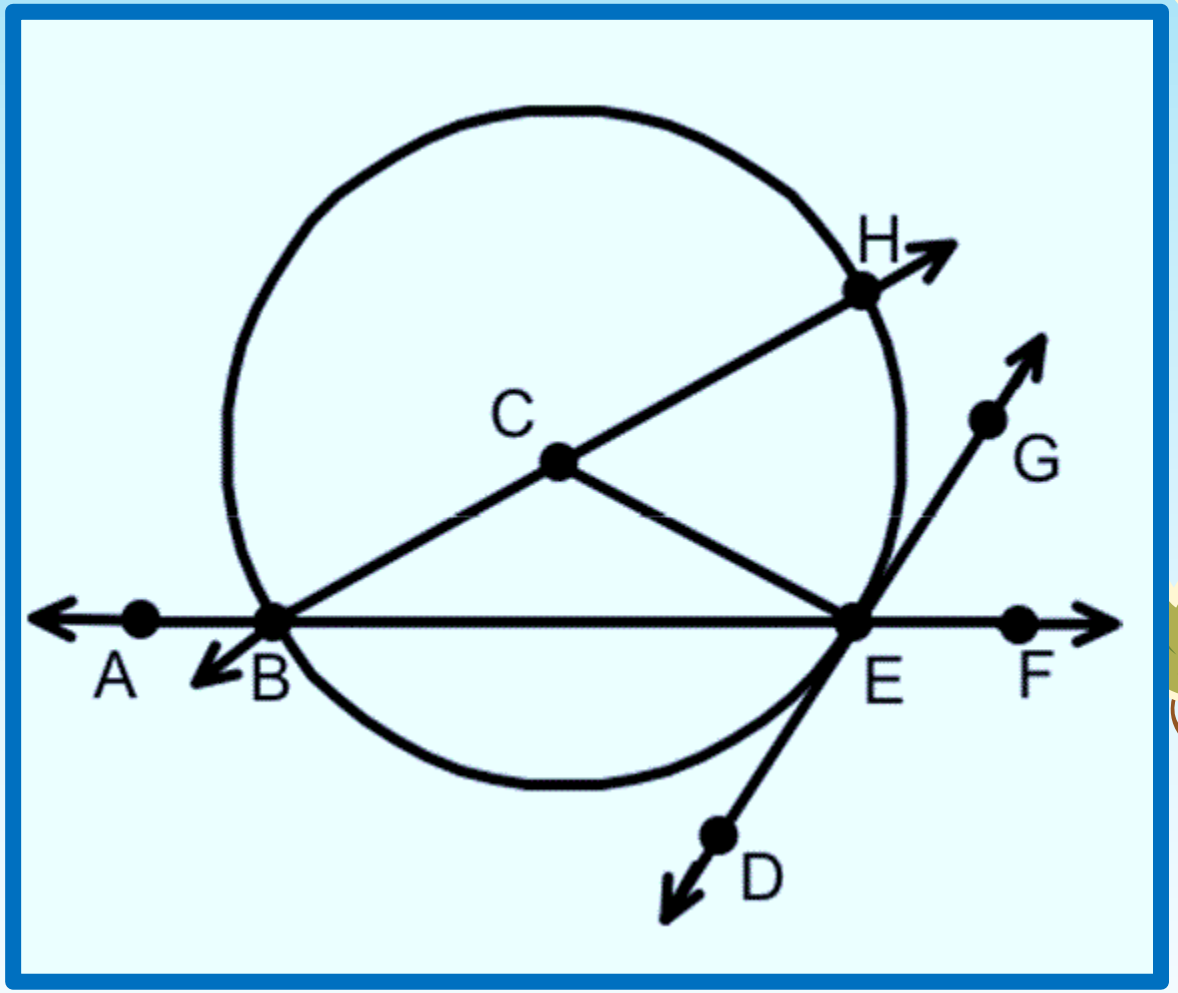
$\angle HCE$

$\angle BCE$



Inscribed Angle

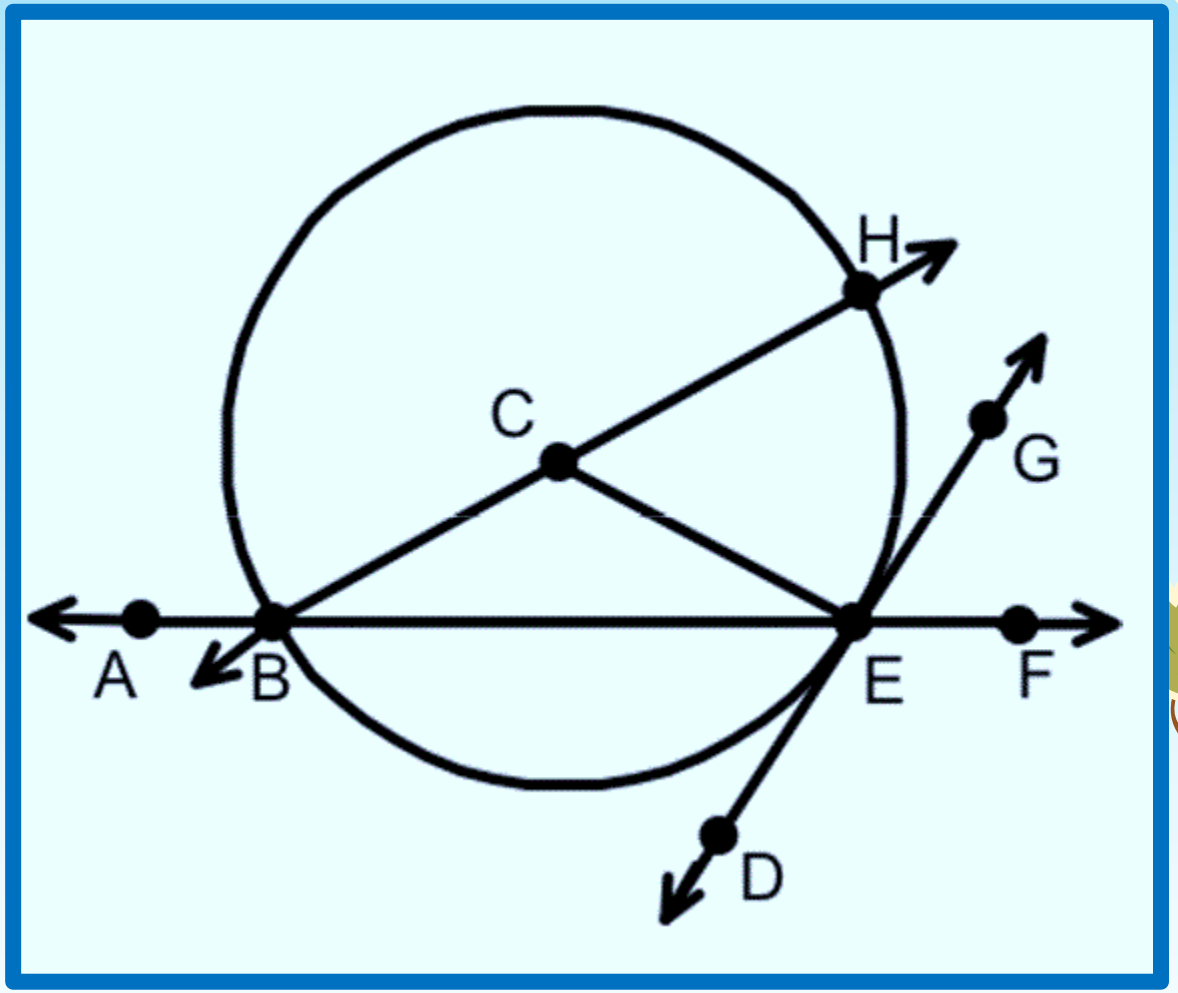
$\angle HBE$



Minor Arc

$\overset{\frown}{HE}$

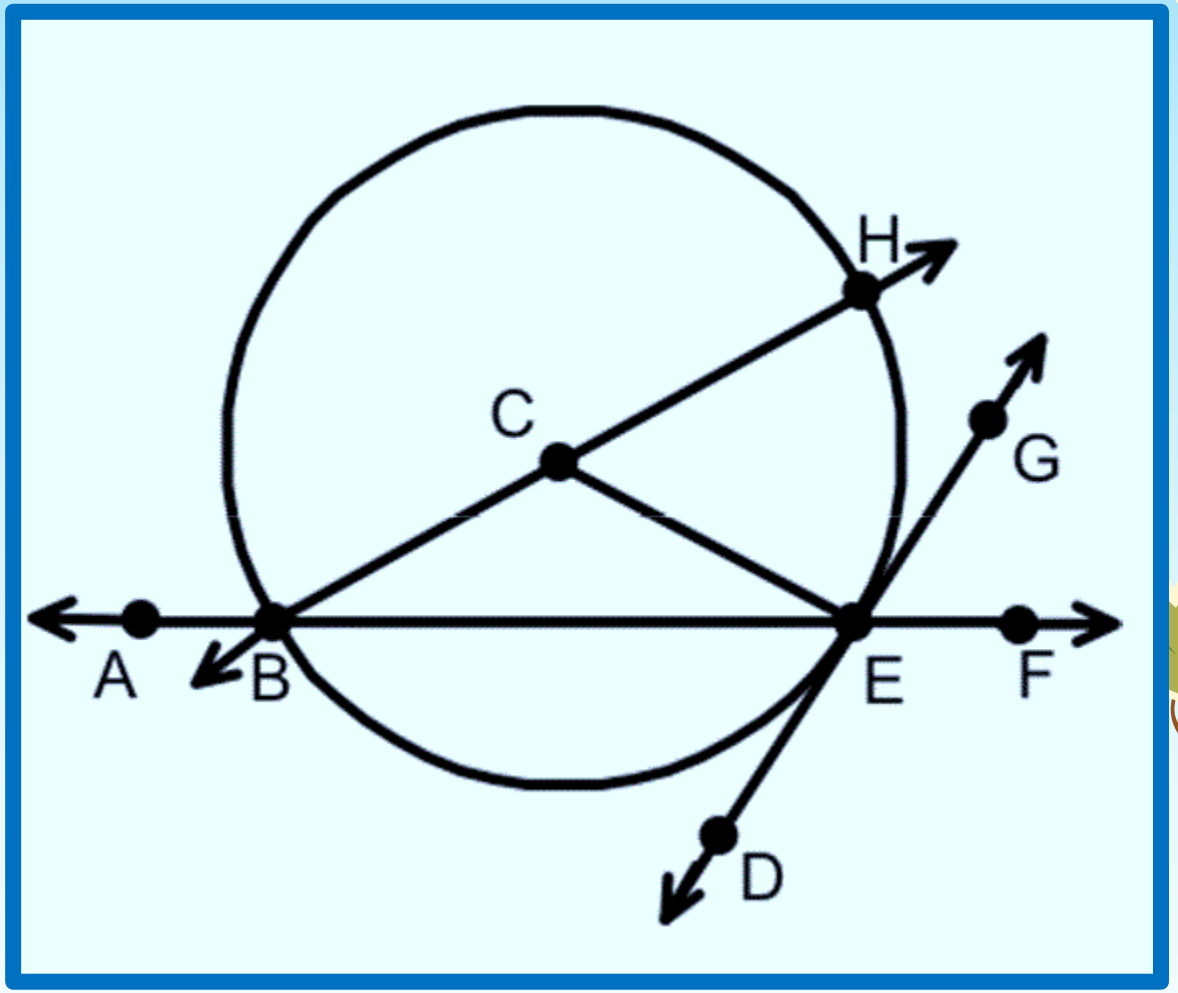
$\overset{\frown}{BE}$



Major Arc

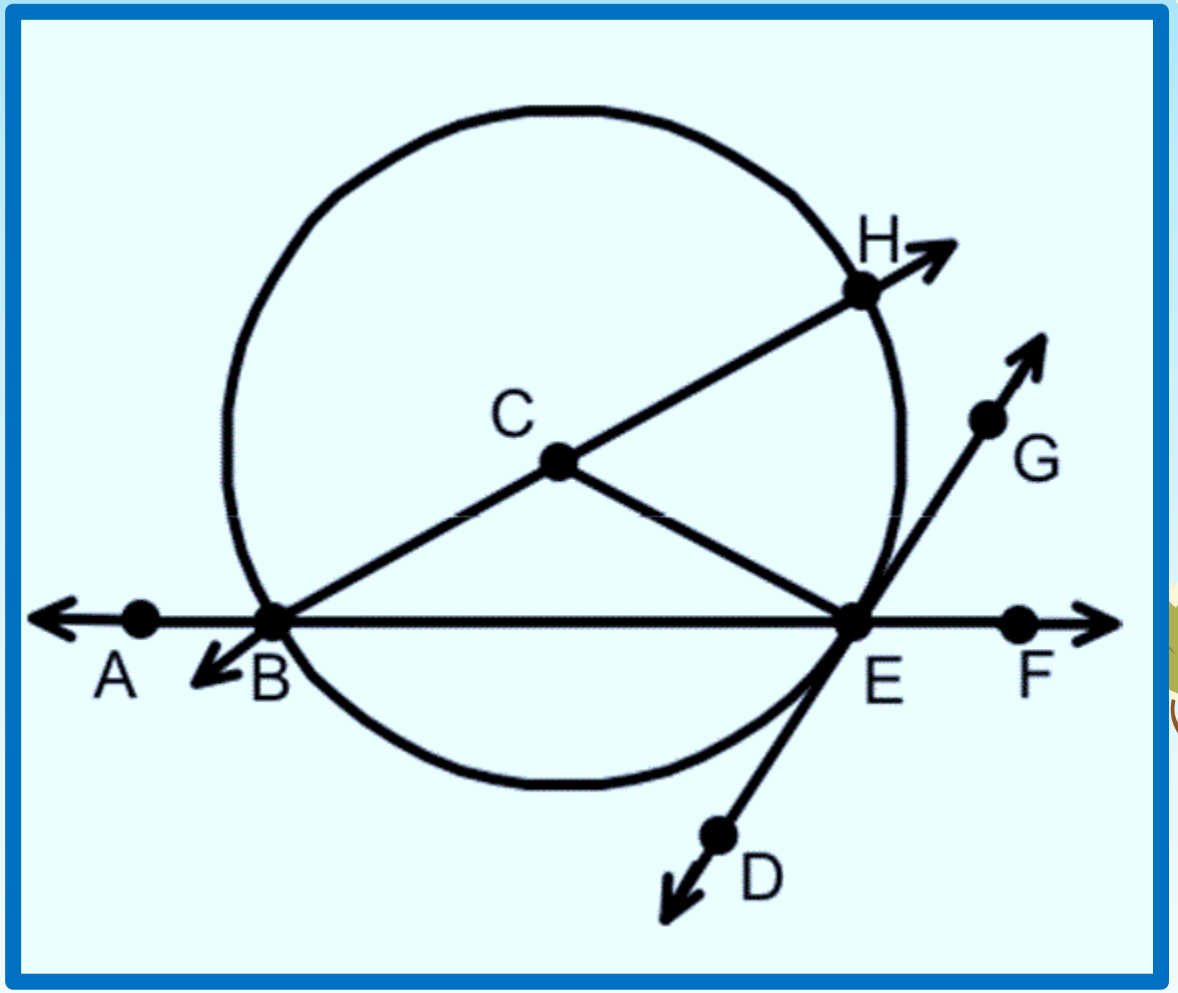
$\overset{\frown}{HBE}$

$\overset{\frown}{EHB}$



Semicircle

$\overset{\frown}{BEH}$



DESMOS: Central Angles v. Inscribed Angles

Go to: **Student.desmos.com**

Type In: **3DT ZZ6**

https://student.desmos.com/join/3dtzz6

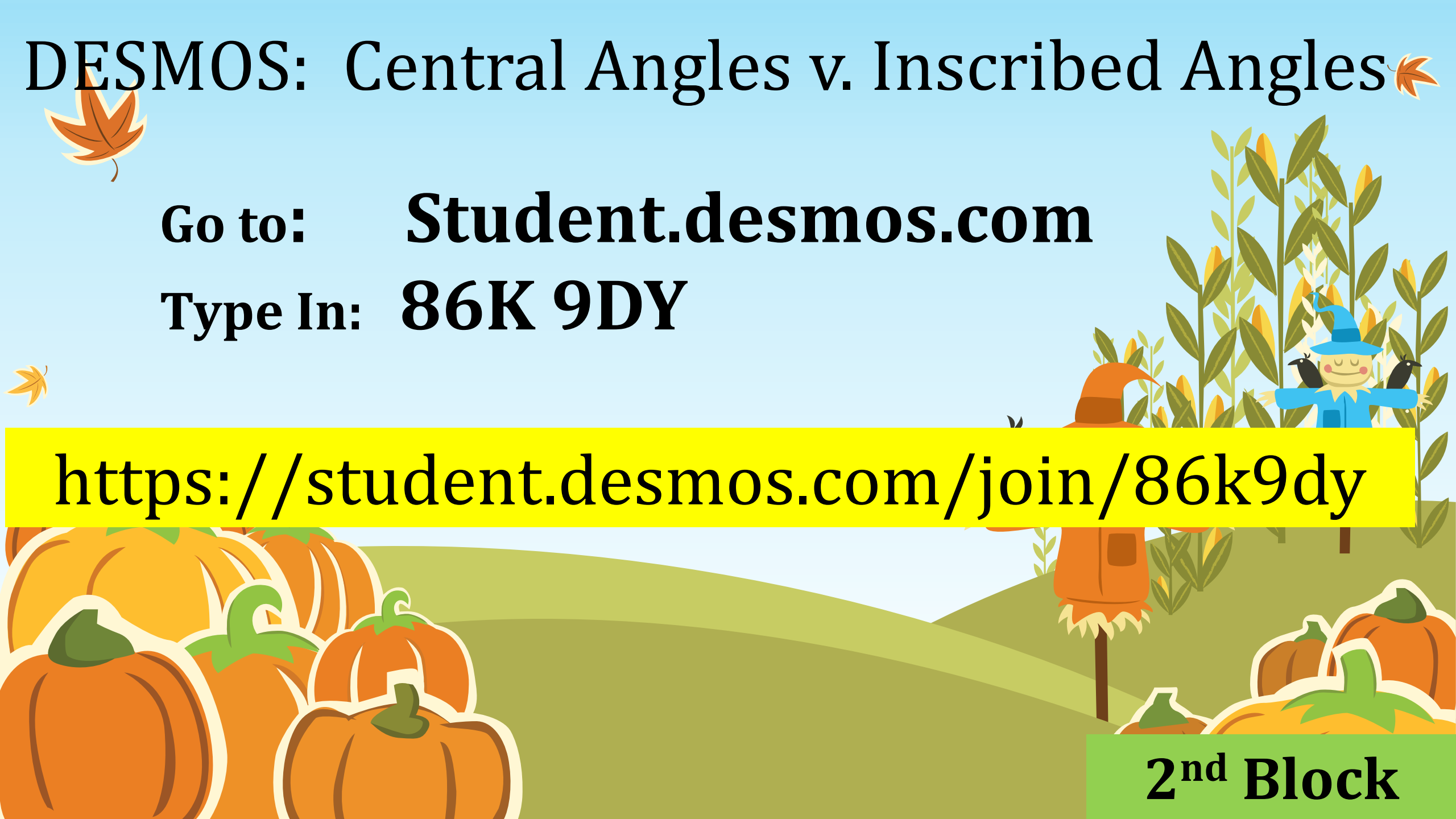
1st Block

DESMOS: Central Angles v. Inscribed Angles

Go to: **Student.desmos.com**

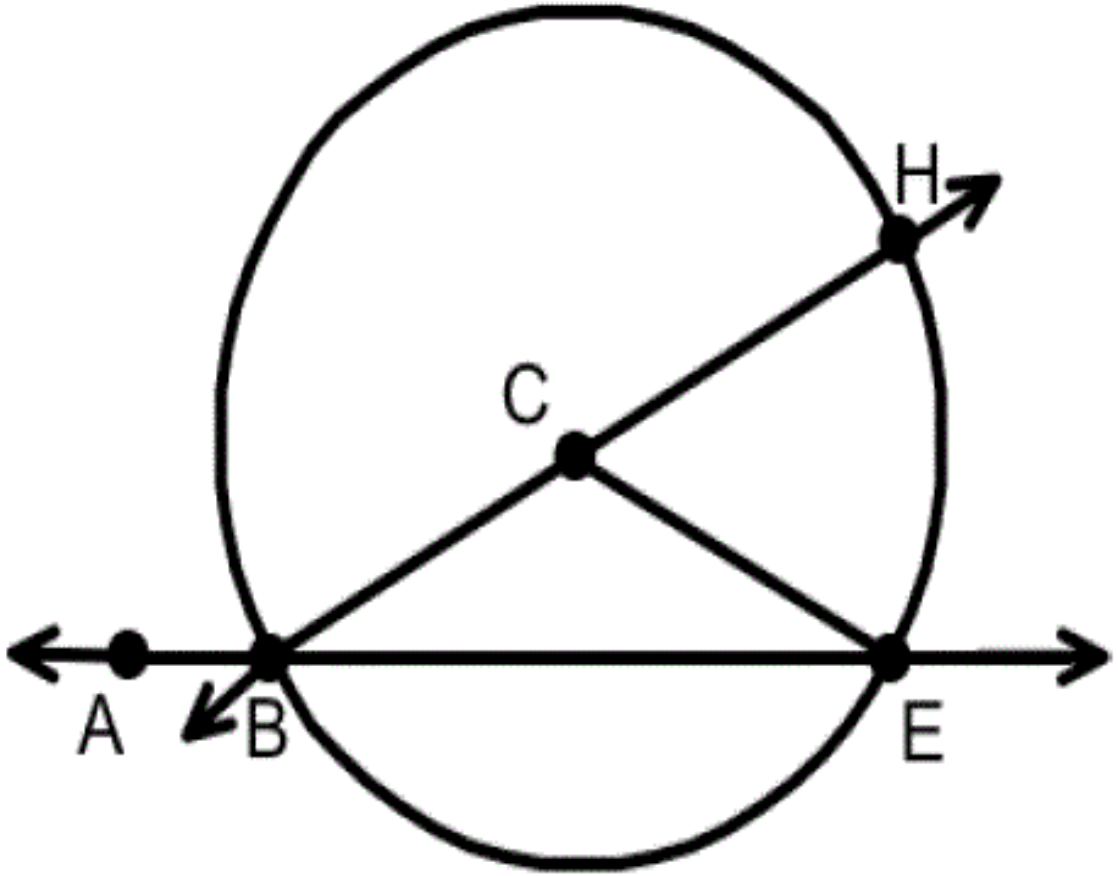
Type In: **86K 9DY**

https://student.desmos.com/join/86k9dy



2nd Block

Find the missing angle or arc:



1. If $m\angle HCE = 50°$, then:

   a. $m\angle HBE =$ _____.

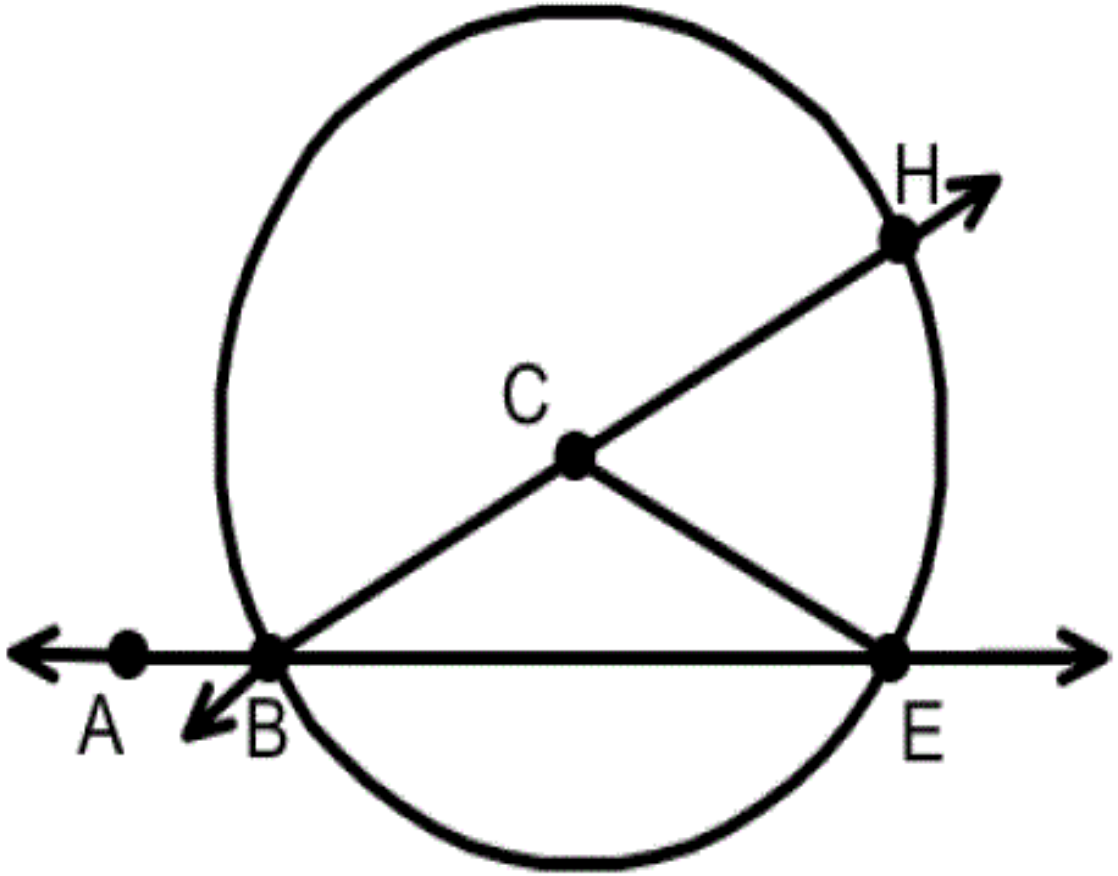
   b. $m\overset{\frown}{HE} =$ _____.

2. If $m\angle EBH = 28°$, then:

   a. $m\angle HCE =$ _____.

   b. $m\overset{\frown}{HE} =$ _____.

Find the missing angle or arc:



1. If $m\angle HCE = 50°$, then:

   a. $m\angle HBE =$ **310°**.

   b. $m\overset{\frown}{HE} =$ **50°**.

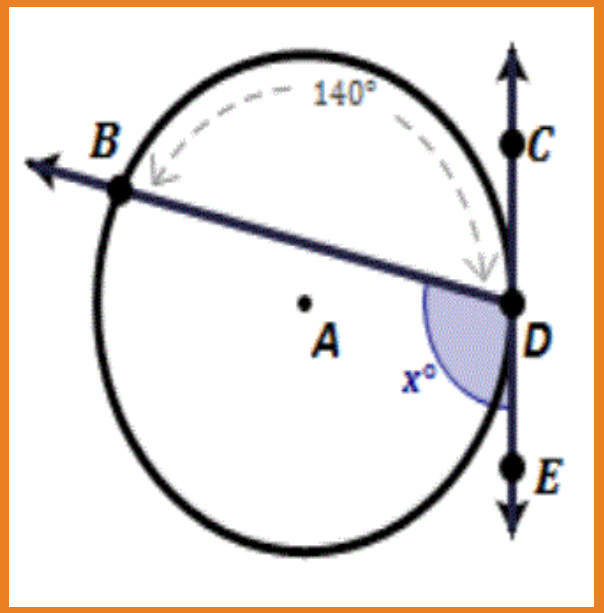
2. If $m\angle EBH = 28°$, then:

   a. $m\angle HCE =$ **56°**.

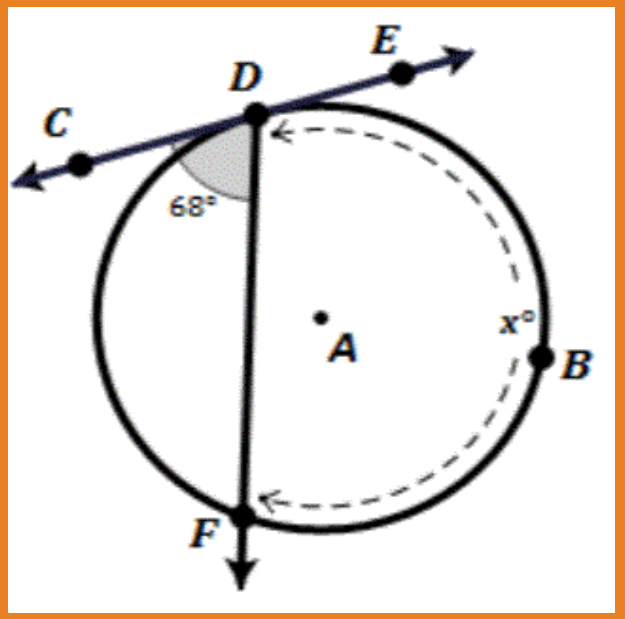
   b. $m\overset{\frown}{HE} =$ **56°**.

PUTTING IT ALL TOGETHER!

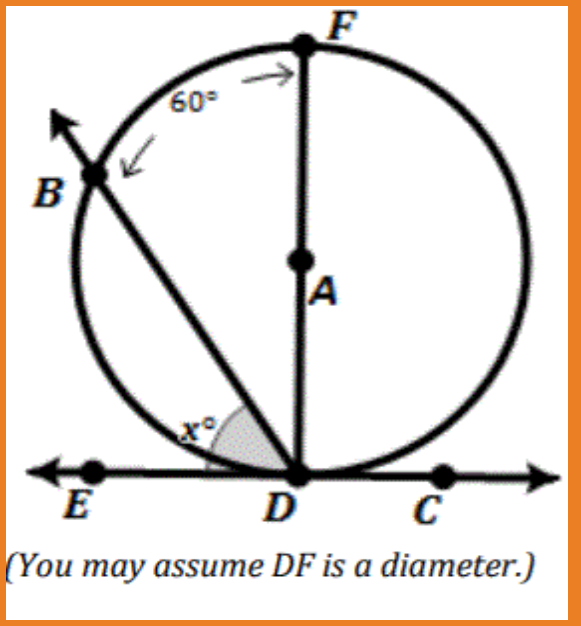
EX 1:



EX 2:



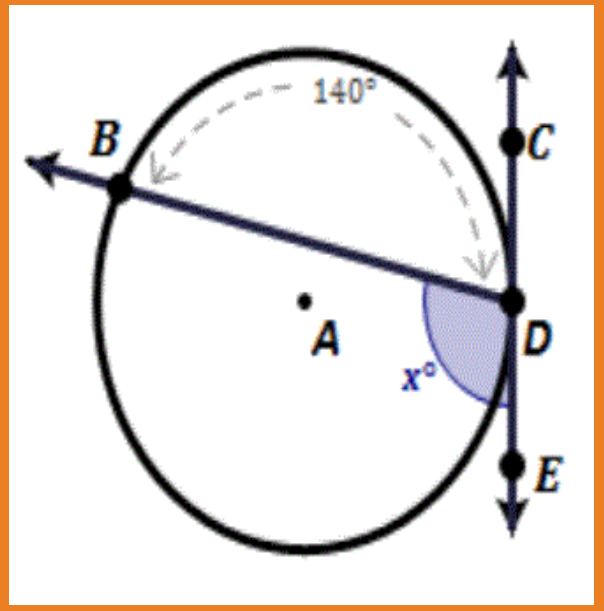
EX 3:



(You may assume DF is a diameter.)

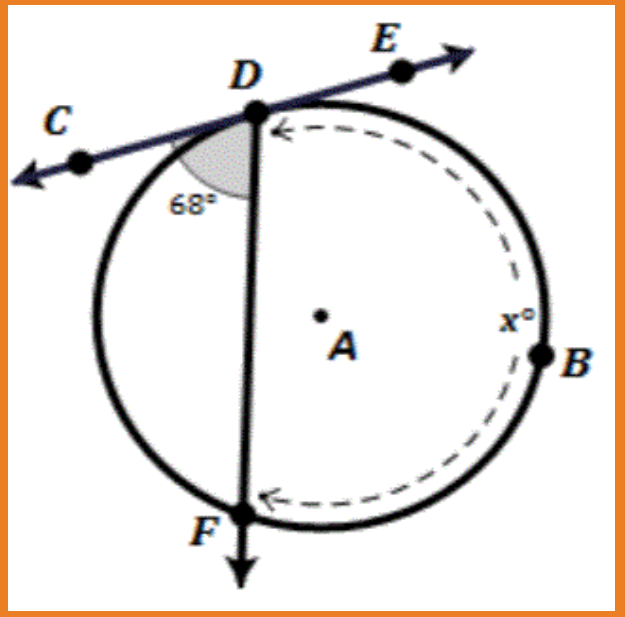
PUTTING IT ALL TOGETHER!

EX 1:



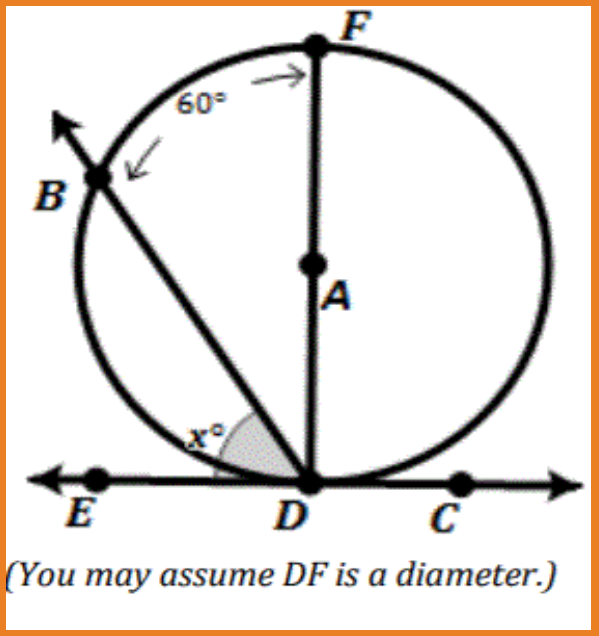
x = 110°

EX 2:



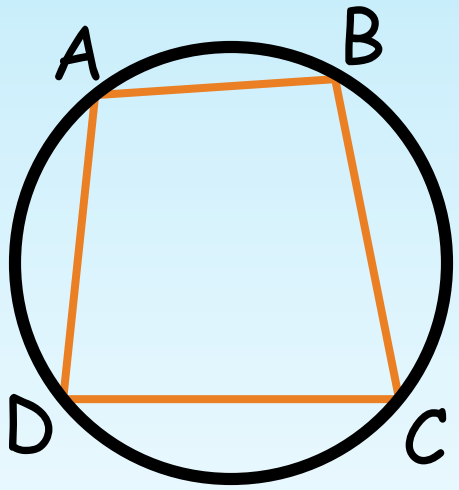
x = 224°

EX 3:



x = 60°

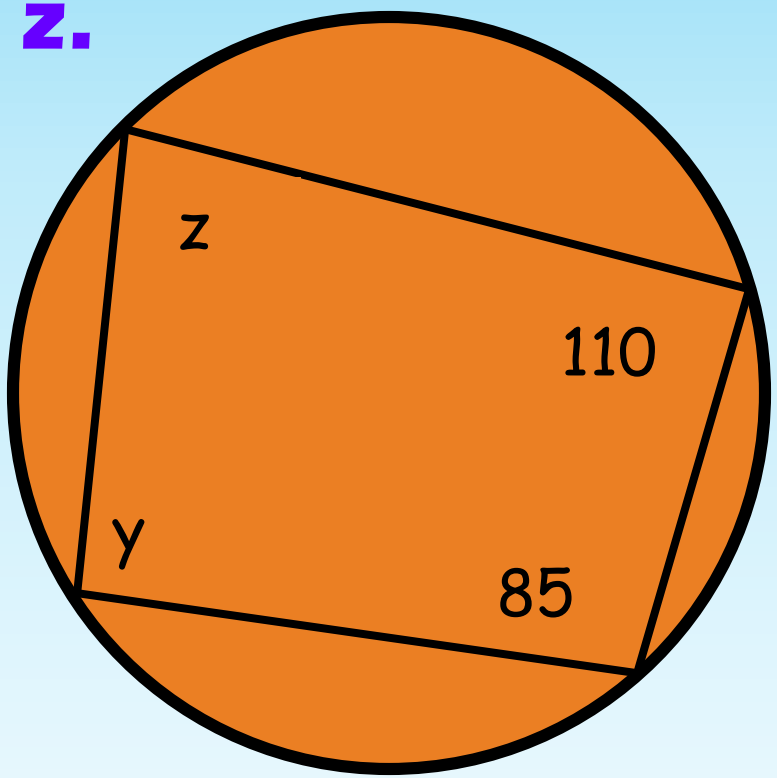
A circle can be circumscribed around a quadrilateral if and only if its opposite angles are supplementary.



$$m\angle A + m\angle C = 180$$

$$m\angle B + m\angle D = 180$$

Example: ***Find y and z.***



$110 + y = 180$

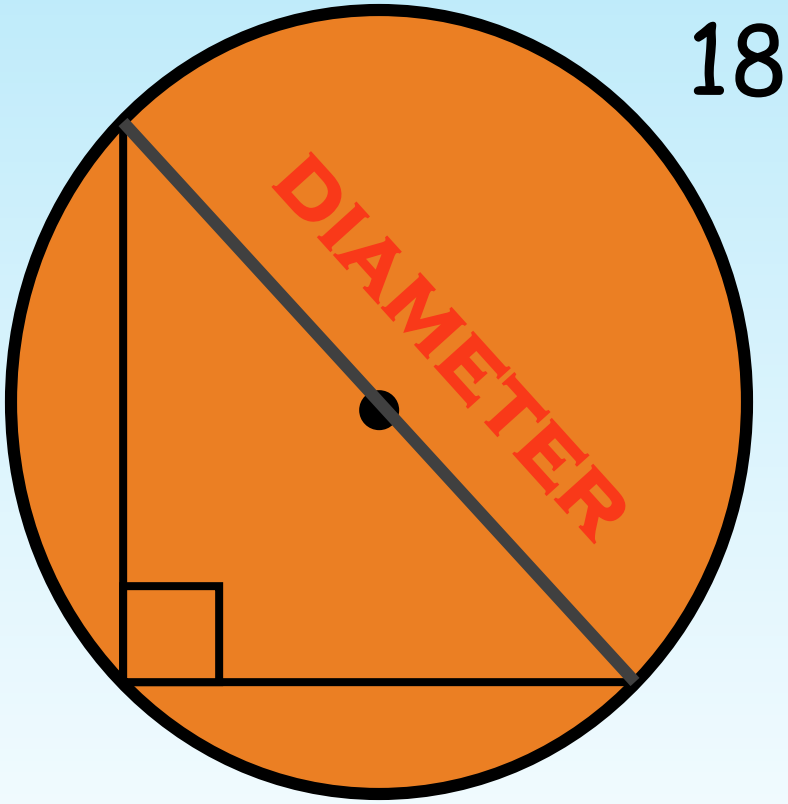
$y = 70$

$z + 85 = 180$

$z = 95$

If a right triangle is inscribed in a circle then the *hypotenuse* is the diameter of the circle

AND the angle opposite the diameter is a right angle.



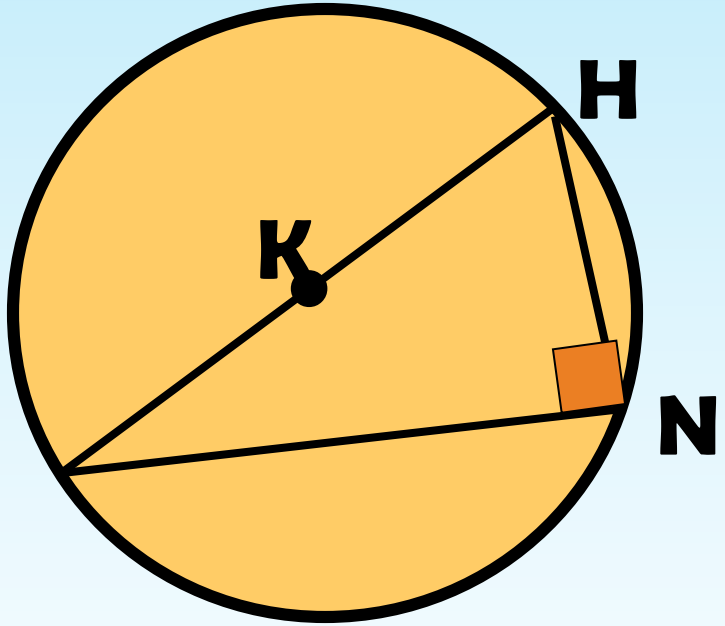
180^{o}

Example:

In ⊙K, $\overline{GH}$ is a diameter and $m\angle GNH = 4x - 14$.
Find the value of x.

$$4x - 14 = 90$$

$$x = 26$$



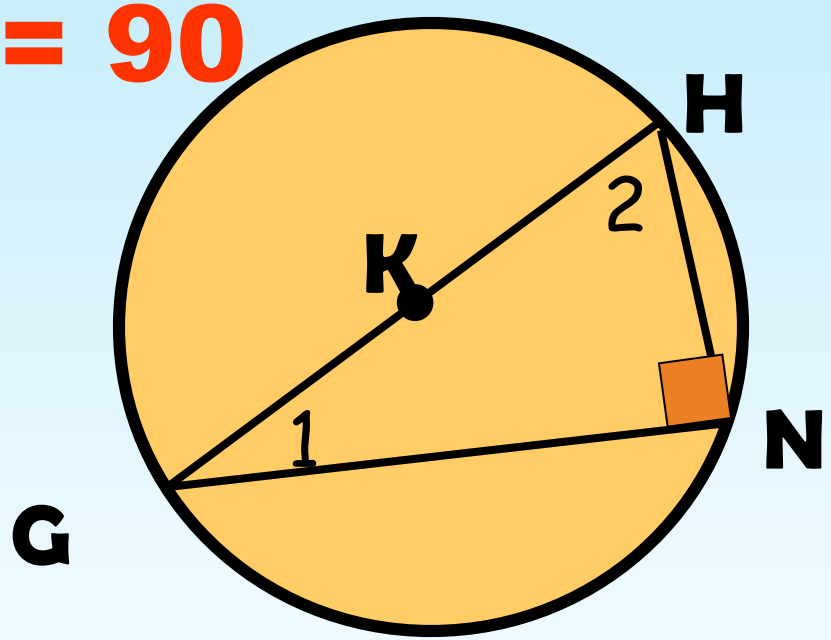
HINT: GH is also the ___hypotenuse___.
Therefore, angle GNH is a ___right___ angle.

Example 7

⊙K is a right triangle. In ⊙K, $m\angle 1 = 6x - 5$ and $m\angle 2 = 3x - 4$. Find the value of x.

$$6x - 5 + 3x - 4 = 90$$

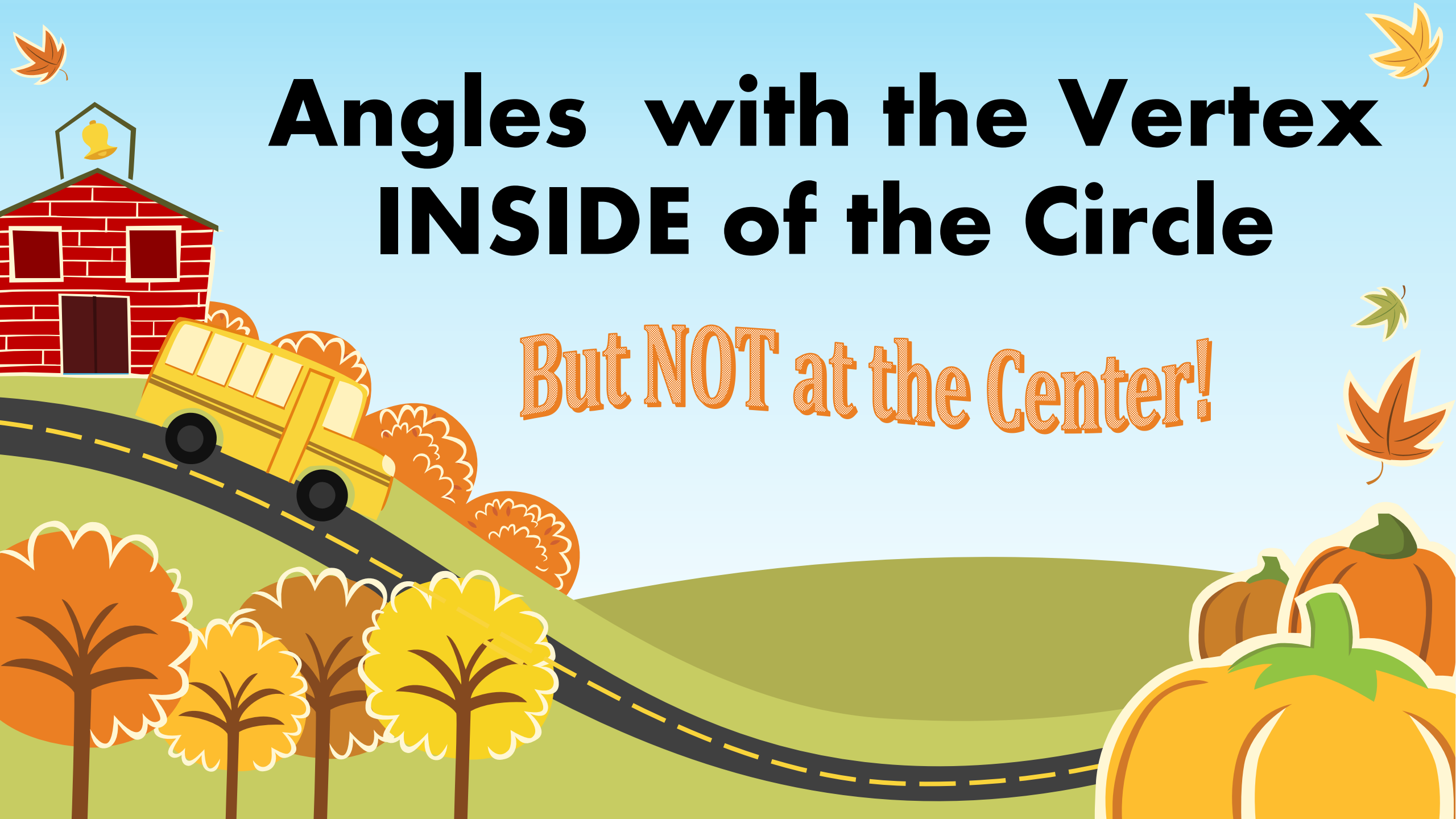
$$x = 11$$



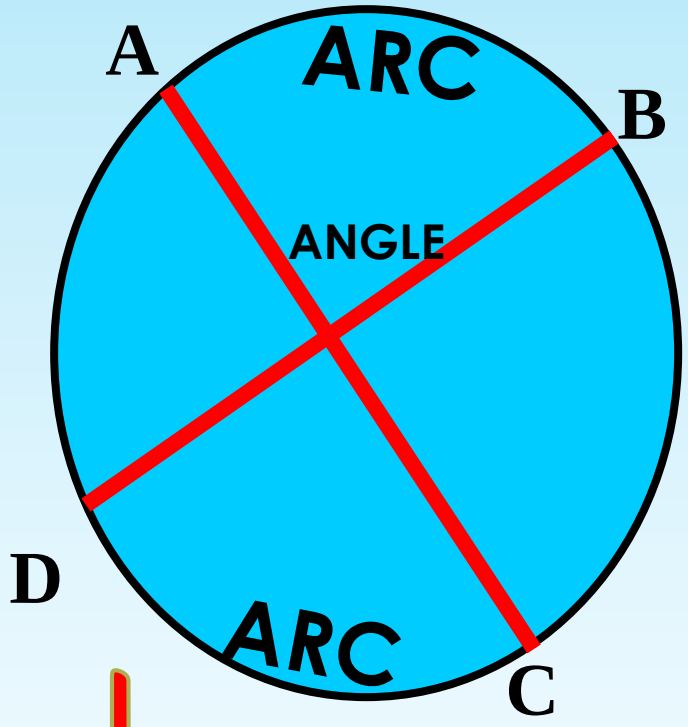
HINT: Angle GNH is a ___right___ angle.
Therefore, angles G & H are complementary.

Angles with the Vertex INSIDE of the Circle

But NOT at the Center!



TYPE III: Vertex is **inside** the circle



$$\text{ANGLE} = \frac{(\text{ARC} + \text{ARC})}{2}$$

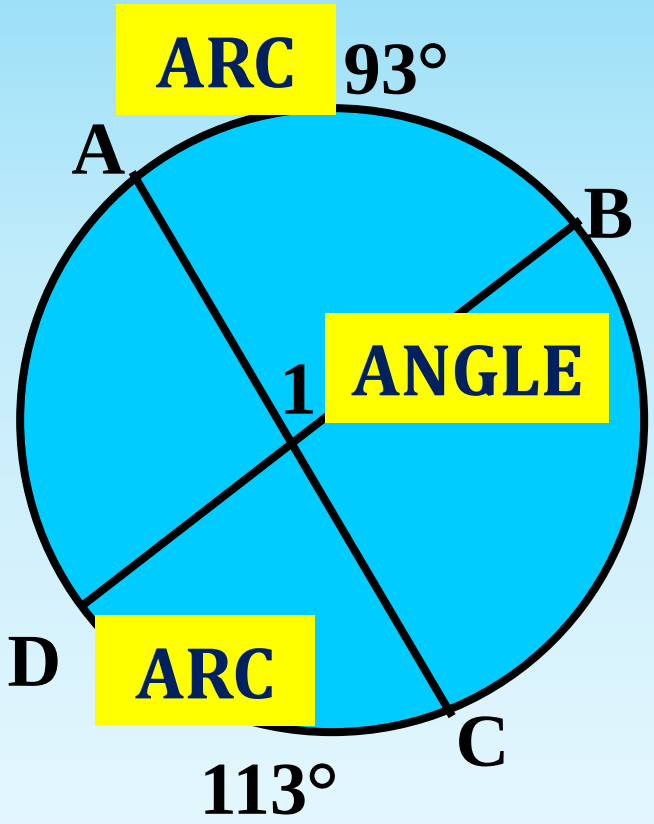
Looks like a PLUS sign!

Ex. 1: Find $m\angle 1$.

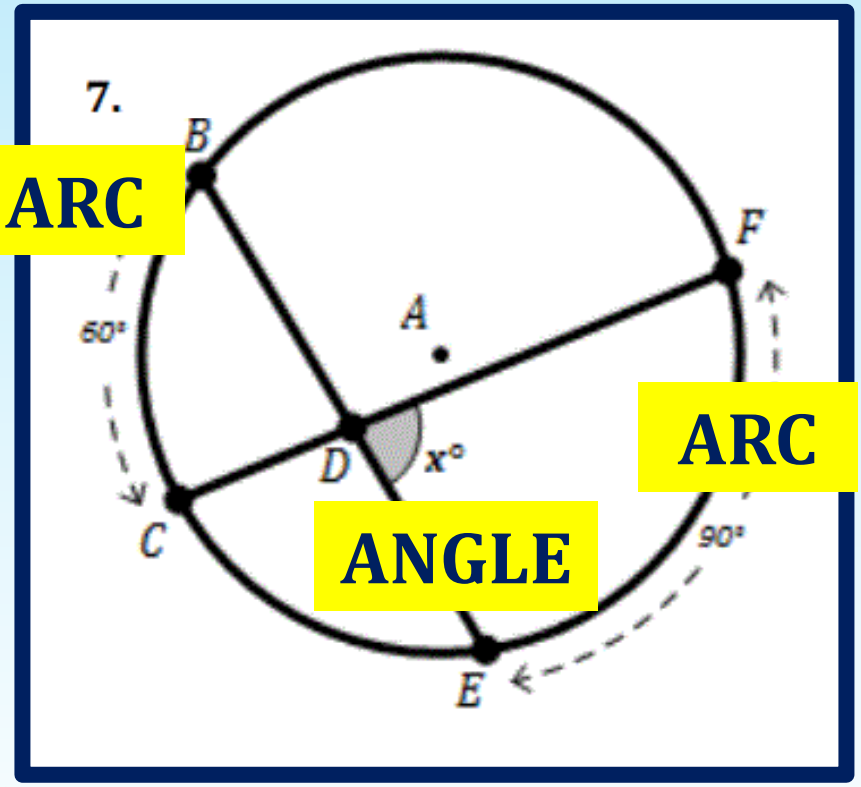
$$\text{ANGLE} = \frac{(\text{ARC} + \text{ARC})}{2}$$

$$m\angle 1 = \frac{93+113}{2}$$

$$m\angle 1 = 103^{\circ}$$



EX 2: Find the measure of the missing angle.

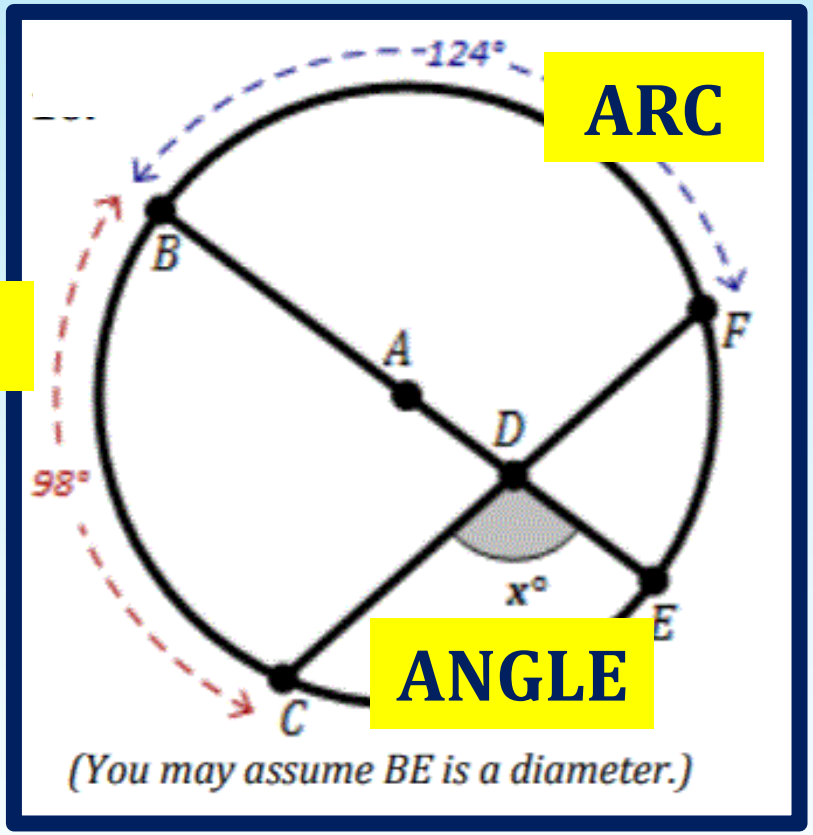


$$\text{ANGLE} = \frac{(\text{ARC} + \text{ARC})}{2}$$

$$x = \frac{60 + 90}{2}$$

75°

EX 3: Find the measure of the missing angle.



$$\text{ANGLE} = \frac{(\text{ARC} + \text{ARC})}{2}$$

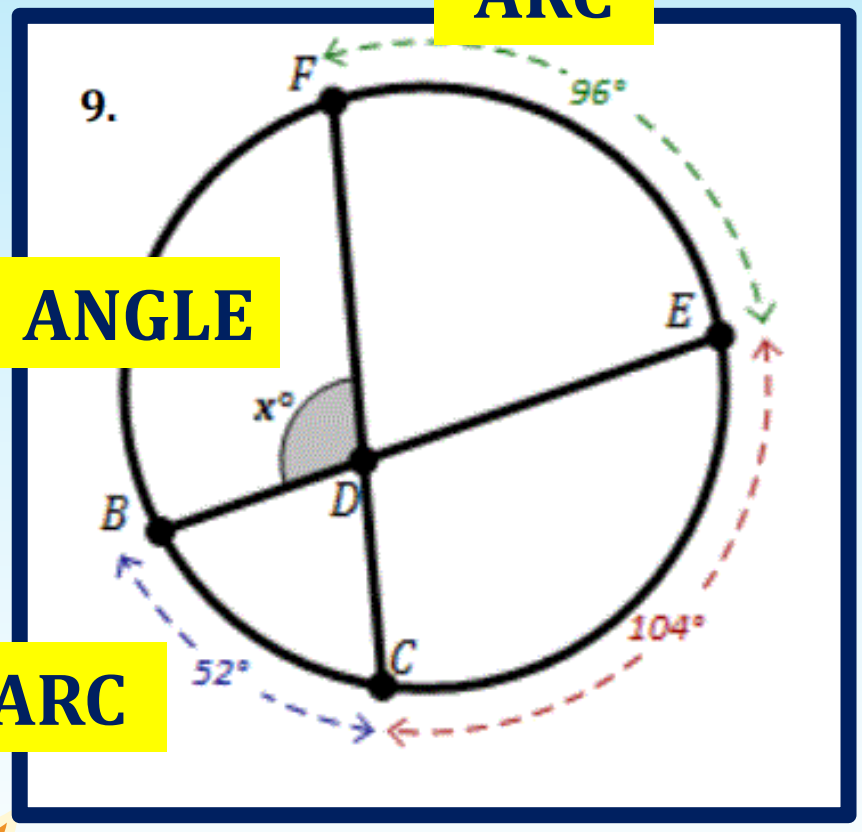
$$x = \frac{124 + 82}{2}$$

103°

180°- 98° = 82°

EX 4: Find the measure of the missing angle.

ARC



ANGLE

ARC

$$\text{ANGLE} = \frac{(\text{ARC} + \text{ARC})}{2}$$

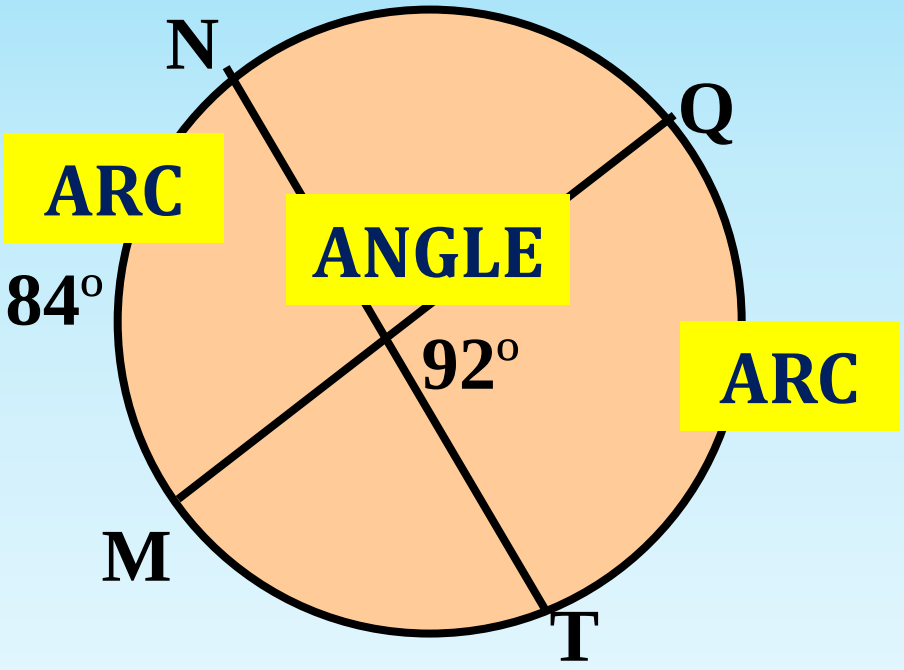
$$x = \frac{96 + 52}{2}$$

$$x = 74°$$

$$180° - 74° = 106°$$

Ex. 5: Find $m\overset{\frown}{QT}$.

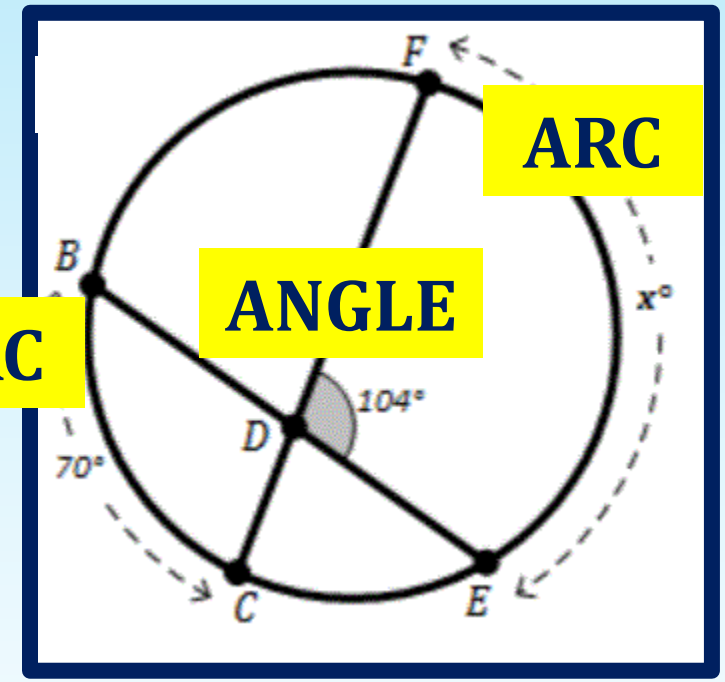
$$\text{ANGLE} = \frac{(\text{ARC} + \text{ARC})}{2}$$



$$92 = \frac{84 + QT}{2}$$

$$m\overset{\frown}{QT} = 100^{\circ}$$

EX 6: Find the measure of the missing arc.



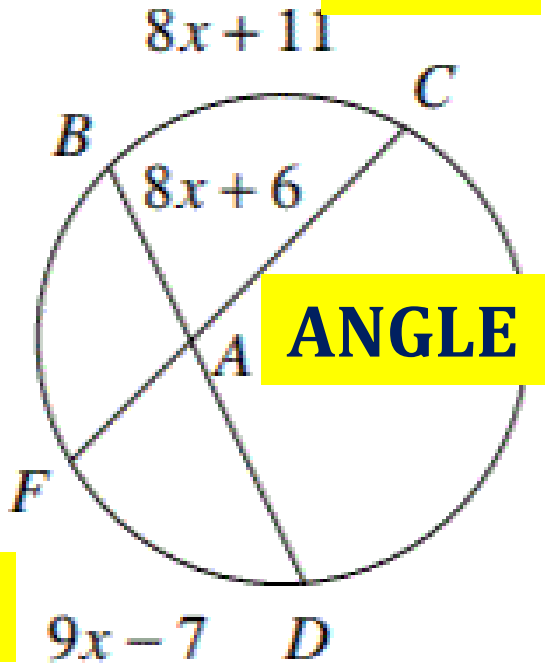
$$\text{ANGLE} = \frac{(\text{ARC} + \text{ARC})}{2}$$

$$\mathbf{104} = \frac{\boldsymbol{x} + \mathbf{70}}{\mathbf{2}}$$

138°

EX 7: Find the measure of arc BC.

Find $m\overset{\frown}{BC}$



ARC

ANGLE

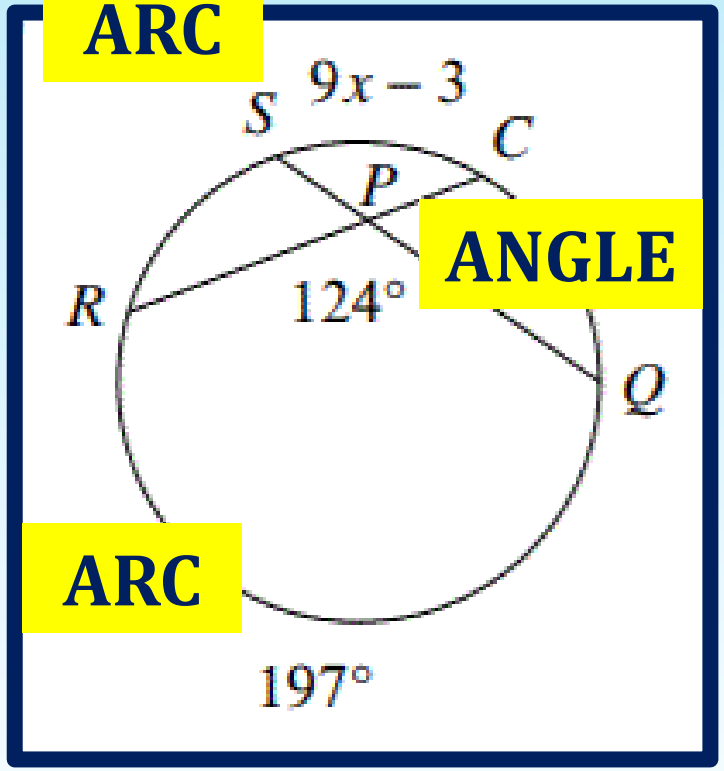
ARC

$$\text{ANGLE} = \frac{(\text{ARC} + \text{ARC})}{2}$$

$$8x + 6 = \frac{8x + 11 + 9x - 7}{2}$$

75°

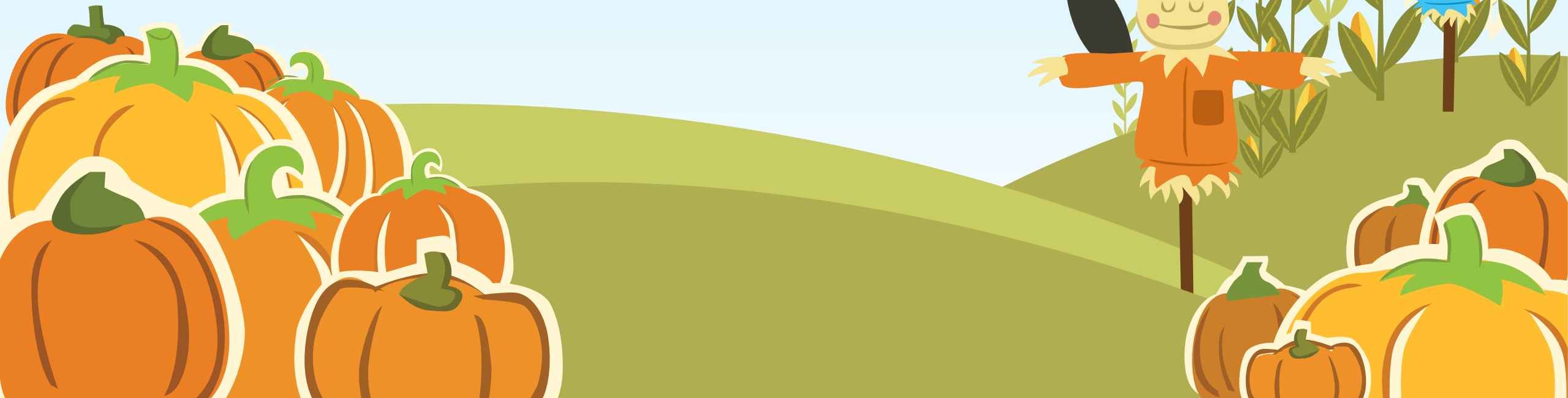
EX 8: Find the measure of the missing arc.



$$\text{ANGLE} = \frac{(\text{ARC} + \text{ARC})}{2}$$

$$\mathbf{124 = \frac{9x - 3 + 197}{2}}$$

51°

Homework: Angles Inside of a Circle

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