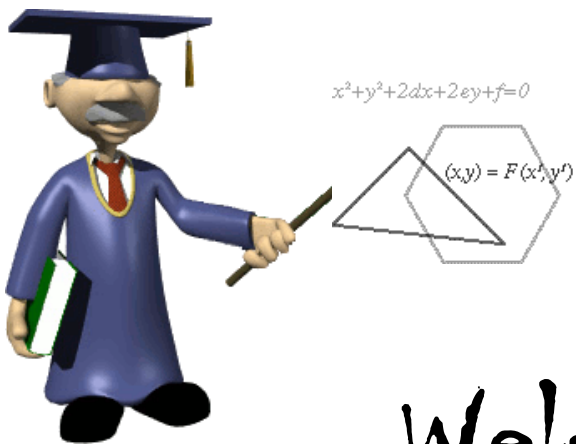
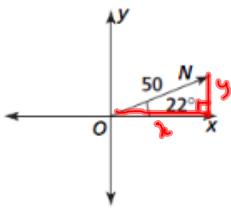


L9.5



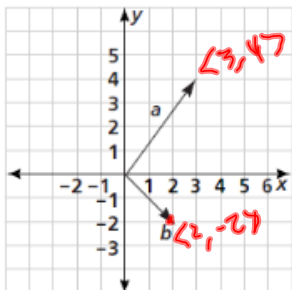
Welcome Back!

Use the diagram for Exercises 1 and 2.

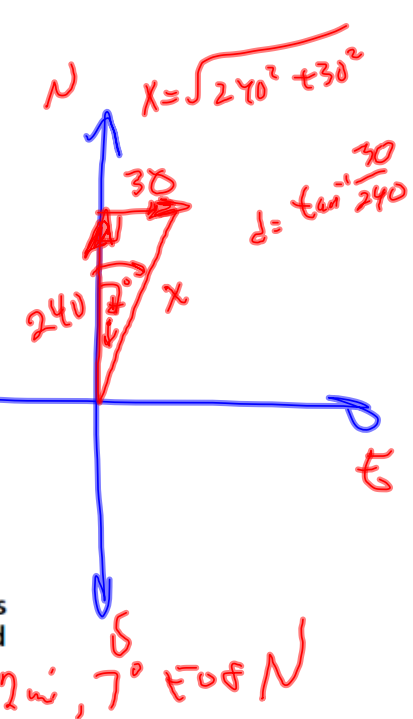


Handwritten notes in red ink:
 $\cos 22^\circ = \frac{x}{50}$
 $\sin 22^\circ = \frac{y}{50}$

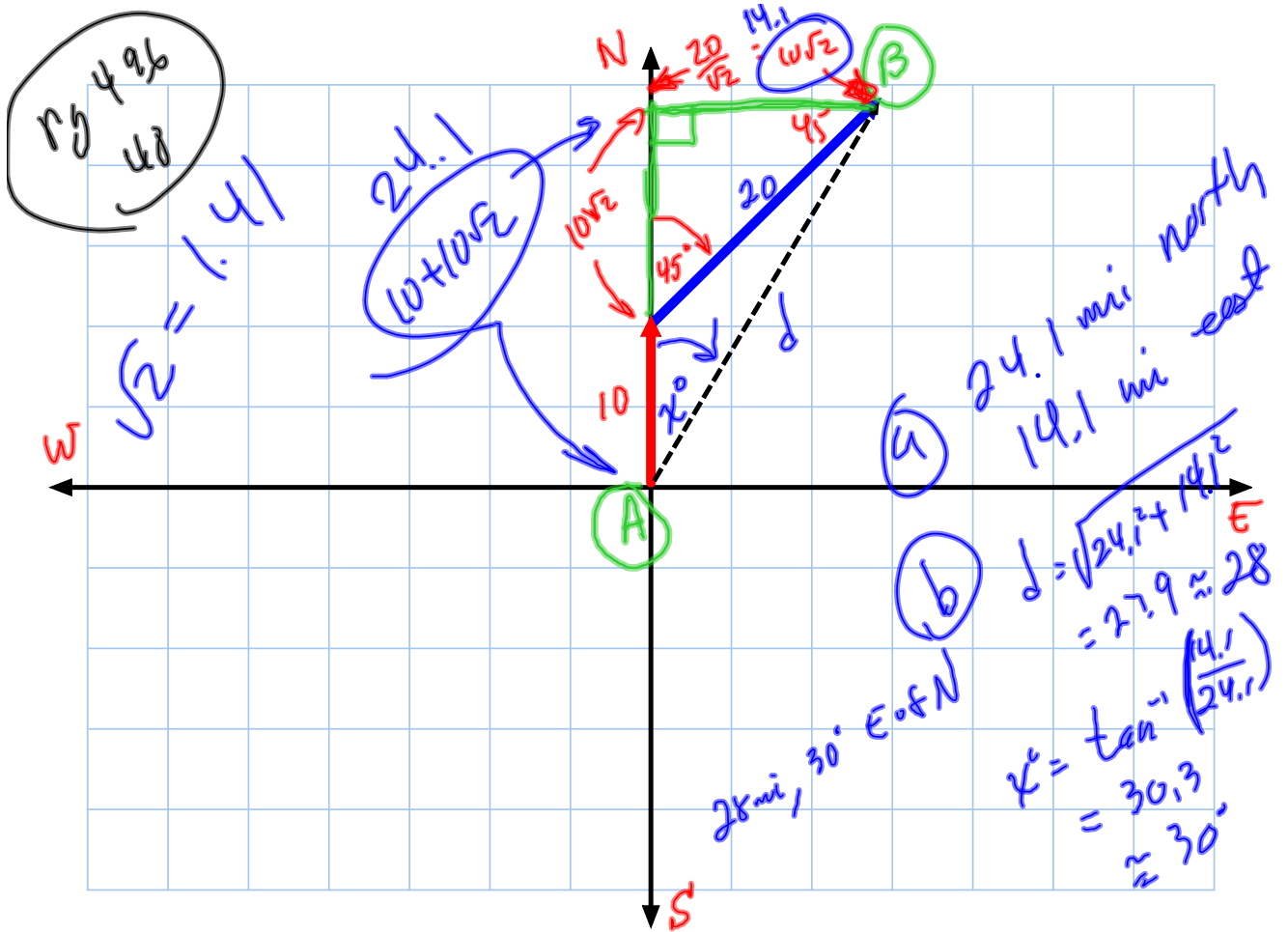
1. Describe the vector as an ordered pair. Round coordinates to the nearest tenth.
2. Use compass directions to describe the direction of \vec{ON} .
3. Iris rode her bike 30 mi south and 16 mi west of her home. Her trip can be described by the vector $\langle -16, -30 \rangle$. Use distance and direction to describe the vector a second way.
4. Write the vector $\vec{v} = \vec{a} + \vec{b}$ as an ordered pair.



Handwritten notes in red ink:
 $\langle 3, 4 \rangle$
 $\langle 2, 2 \rangle$
 $\langle 3, 4 \rangle$
 $\langle 1, -2 \rangle$
 $\langle 5, 2 \rangle$



5. An airplane has a speed of 240 mi/h in still air. The plane heads due north and encounters a 30-mi/h wind blowing due east. Find the resultant speed and direction. Round to the nearest unit.

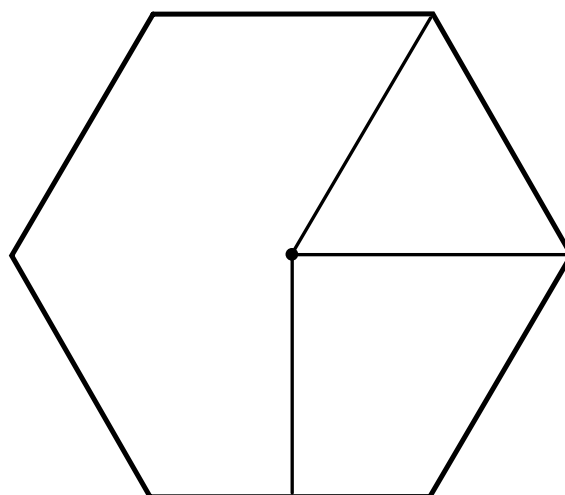


A blast from the past...

L9.5

Label the following parts:

- Center
- Radius
- Apothem
- Center angle
- Side

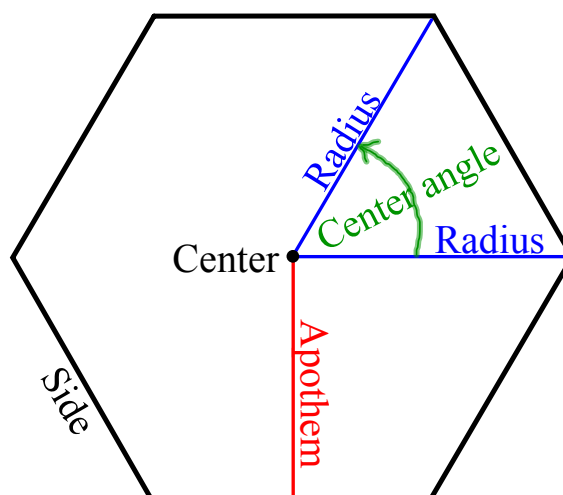


A blast from the past...

L9.5

Label the following parts:

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- Center angle
- Side



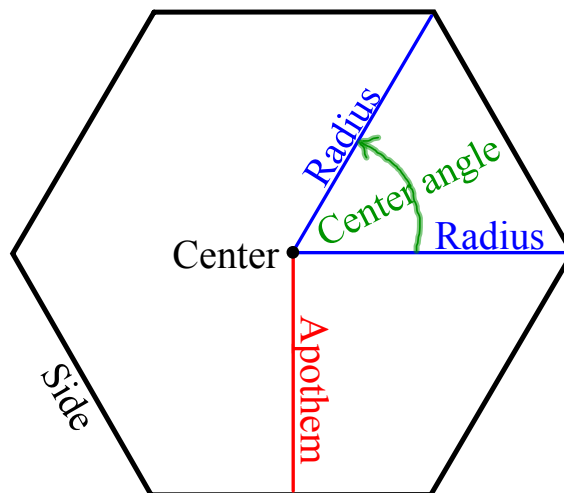
A blast from the past...

L9.5

Label the following parts:

- Center
- Radius
- Apothem
- Center angle
- Side

What is the formula for the area of a regular polygon?



A blast from the past...

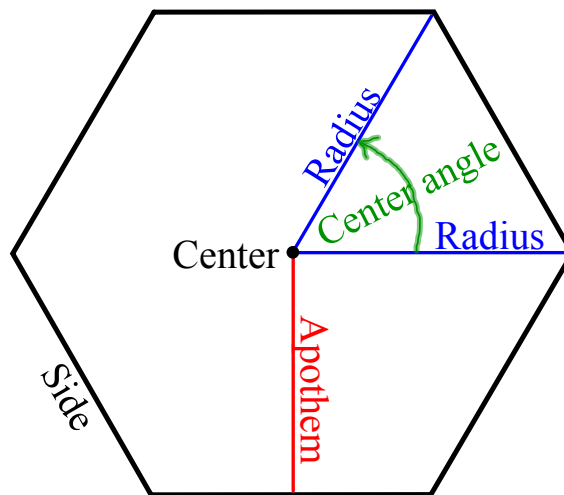
L9.5

Label the following parts:

- Center
- Radius
- Apothem
- Center angle
- Side

What is the formula for the area of a regular polygon?

$$A = \frac{1}{2} ap$$



A blast from the past...

L9.5

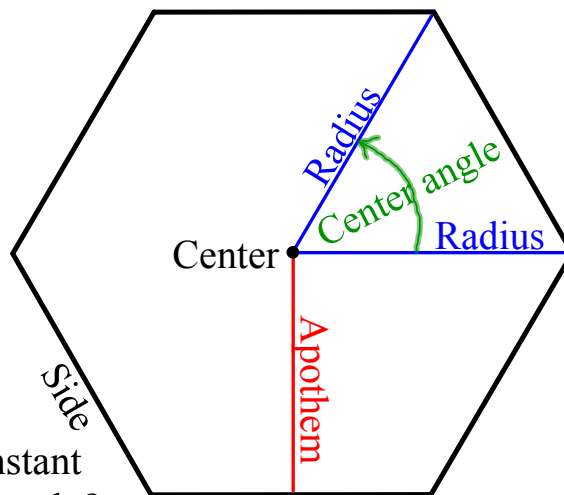
Label the following parts:

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- Center angle
- Side

What is the formula for the area of a regular polygon?

$$A = \frac{1}{2} ap$$

Which of these parts are constant for a specific type of regular poly?



A blast from the past...

L9.5

Label the following parts:

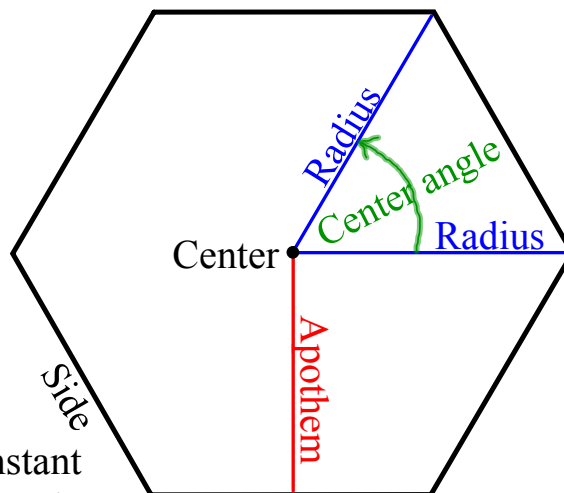
- Center
- Radius
- Apothem
- Center angle
- Side

What is the formula for the area of a regular polygon?

$$A = \frac{1}{2} ap$$

Which of these parts are constant for a specific type of regular poly?

Only center angle



A blast from the past...

L9.5

What is the measure of the center angle of a regular n -gon?

A blast from the past...

L9.5

What is the measure of the center angle of a regular n -gon?

$$\frac{360^\circ}{n}$$

A blast from the past...

L9.5

What is the measure of the center angle of a regular n -gon?

$$\frac{360^\circ}{n}$$

# Sides	Poly Name	Center Angle Measure
3		
4		
5		
6		
8		
9		
10		
n		

A blast from the past...

L9.5

What is the measure of the center angle of a regular n -gon?

$$\frac{360^\circ}{n}$$

# Sides	Poly Name	Center Angle Measure
3	triangle	120
4	quadrilateral	90
5	pentagon	72
6	hexagon	60
8	octagon	45
9	nonagon	40
10	decagon	36
n	n -gon	$360/n$

A blast from the past...

L9.5

What is the measure of the center angle of a regular n -gon?

$$\frac{360^\circ}{n}$$

In chapter 7 we found the area of various reg polys...which of these did you work with?

# Sides	Poly Name	Center Angle Measure
3	triangle	120
4	quadrilateral	90
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A blast from the past...

L9.5

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- Triangle
- Quad
- Hexagon

# Sides	Poly Name	Center Angle Measure
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4	quadrilateral	90
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A blast from the past...

L9.5

What is the measure of the center angle of a regular n -gon?

$$\frac{360^\circ}{n}$$

In chapter 7 we found the area of various reg polys...which of these did you work with?

Triangle
Quad
Hexagon

Why only those?

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A blast from the past...

L9.5

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$$\frac{360^\circ}{n}$$

In chapter 7 we found the area of various reg polys...which of these did you work with?

Triangle
Quad
Hexagon

Why only those?

Only ones that have 30-60-90 or 45-45-90 for apothem triangle

# Sides	Poly Name	Center Angle Measure
3	triangle	120
4	quadrilateral	90
5	pentagon	72
6	hexagon	60
8	octagon	45
9	nonagon	40
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n	n -gon	$360/n$

A blast from the past...

L9.5

Now with the trig ratios
all the rest are open to us!

# Sides	Poly Name	Center Angle Measure
3	triangle	120
4	quadrilateral	90
5	pentagon	72
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A blast from the past...

L9.5

Now with the trig ratios
all the rest are open to us!

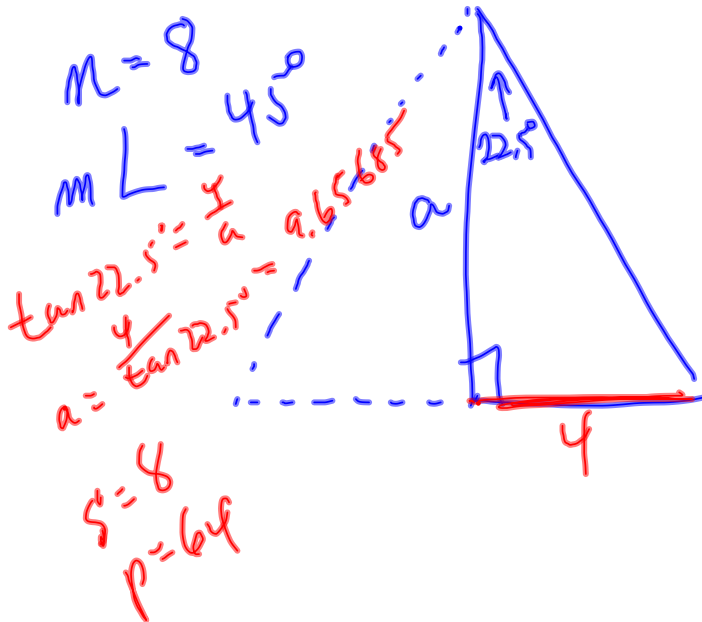
We can work with any center
angle measure!

# Sides	Poly Name	Center Angle Measure
3	triangle	120
4	quadrilateral	90
5	pentagon	72
6	hexagon	60
8	octagon	45
9	nonagon	40
10	decagon	36
n	n -gon	$360/n$



Example

Find the area of a regular octagon w/side length 8m.
Round to nearest 10th.



309.0

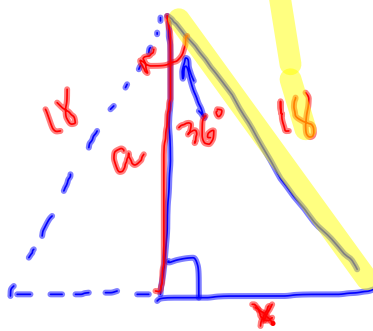
$$A = \frac{1}{2} (9.65685)(64) = 309.0$$

1

Example

Find the area of a regular pentagon w/radius length 18.
Round to nearest 10th.

$$\begin{aligned}n &= 5 \\r &= 18 \\m\angle &= 72^\circ \\s &= 2x\end{aligned}$$



$$\cos 36^\circ = \frac{a}{18}$$

$$\begin{aligned}a &= 18 \cos 36^\circ \\&= 14.5623\end{aligned}$$

$$\begin{aligned}x &= 18 \sin 36^\circ \\&= 10.5801\end{aligned}$$

$$\begin{aligned}A &= \frac{1}{2} ap \\&= 110.4\end{aligned}$$

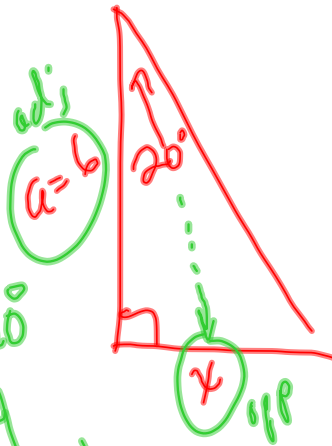
2

Example

Find the area of a regular nonagon w/apothem 6.
Round to nearest 10th.

$$n = 9$$
$$a = 6$$
$$mL = \frac{360}{9} = 40$$

$$\tan 20^\circ = \frac{x}{6}$$
$$x = 6 \tan 20^\circ$$
$$= 2.184$$
$$s = 4.368$$



SOH - CAT - TOA
↑↑

$$A = \frac{1}{2} a p = 117.9$$

3

How to find the area of any reg poly...

L9.5

Write the steps to take in order to find the area of a regular polygon w/ n sides.

How to find the area of any reg poly...

L9.5

Write the steps to take in order to find the area of a regular polygon w/ n sides.

- 1) Determine # sides

How to find the area of any reg poly...

L9.5

Write the steps to take in order to find the area of a regular polygon w/ n sides.

- 1) Determine # sides
- 2) Determine center angle

How to find the area of any reg poly...

L9.5

Write the steps to take in order to find the area of a regular polygon w/ n sides.

- 1) Determine # sides
- 2) Determine center angle
- 3) Determine apothem

How to find the area of any reg poly...

L9.5

Write the steps to take in order to find the area of a regular polygon w/ n sides.

- 1) Determine # sides
- 2) Determine center angle
- 3) Determine apothem
- 4) Determine perimeter

How to find the area of any reg poly...

L9.5

Write the steps to take in order to find the area of a regular polygon w/ n sides.

- 1) Determine # sides
- 2) Determine center angle
- 3) Determine apothem
- 4) Determine perimeter

... for any of the above

How to find the area of any reg poly...

L9.5

Write the steps to take in order to find the area of a regular polygon w/ n sides.

- 1) Determine # sides
- 2) Determine center angle
- 3) Determine apothem
- 4) Determine perimeter

... for any of the above
* may be given

How to find the area of any reg poly...

L9.5

Write the steps to take in order to find the area of a regular polygon w/ n sides.

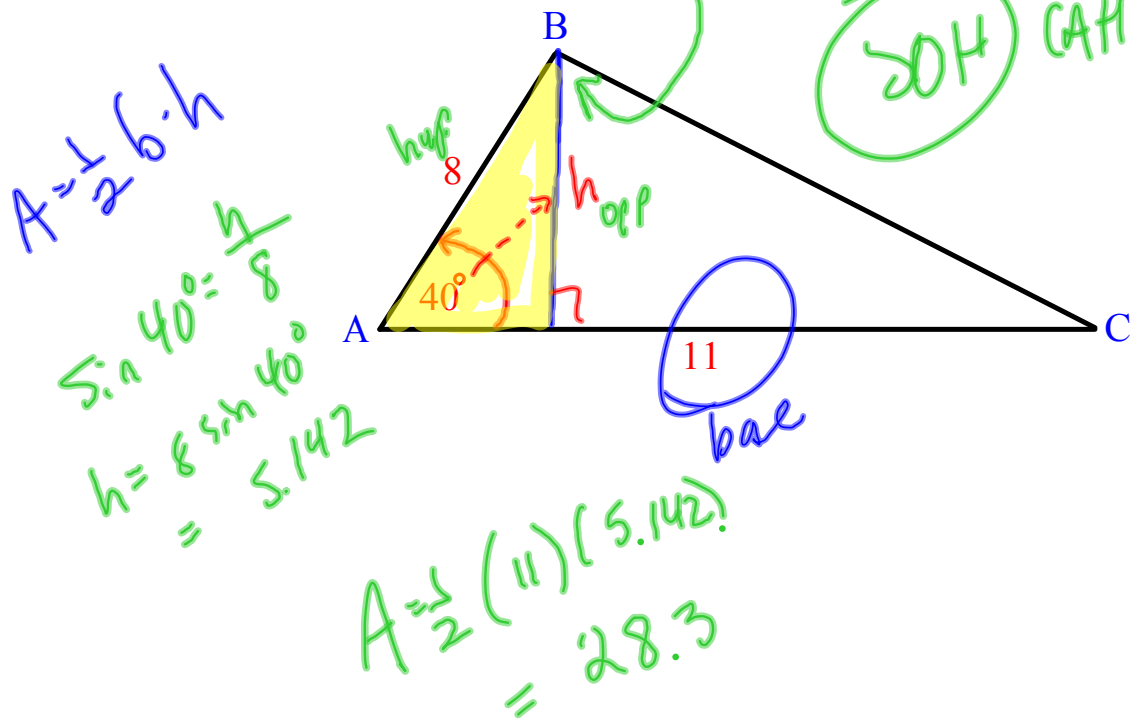
- 1) Determine # sides
- 2) Determine center angle
- 3) Determine apothem
- 4) Determine perimeter

... for any of the above

- * may be given
- * use trig ratios if not

Challenge question

Find the area of this Δ (round to 10th):

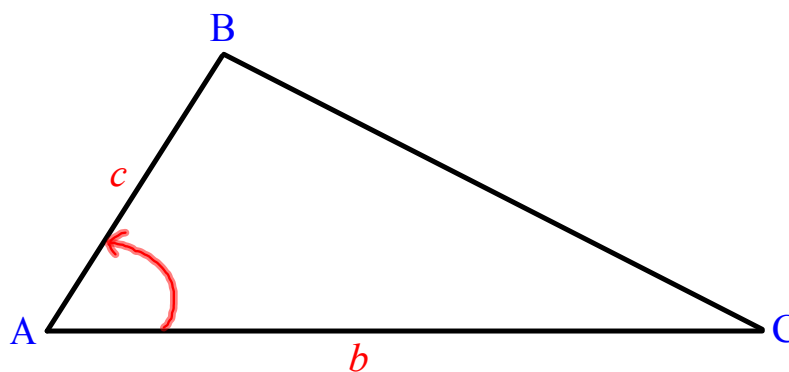


1

Theorem 9-1

L9.5

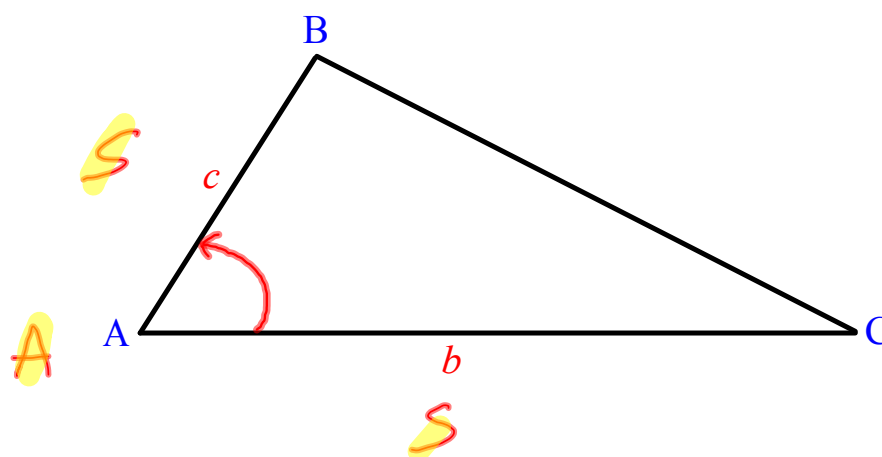
What is the formula for the area of any Δ given SAS info?



Theorem 9-1

L9.5

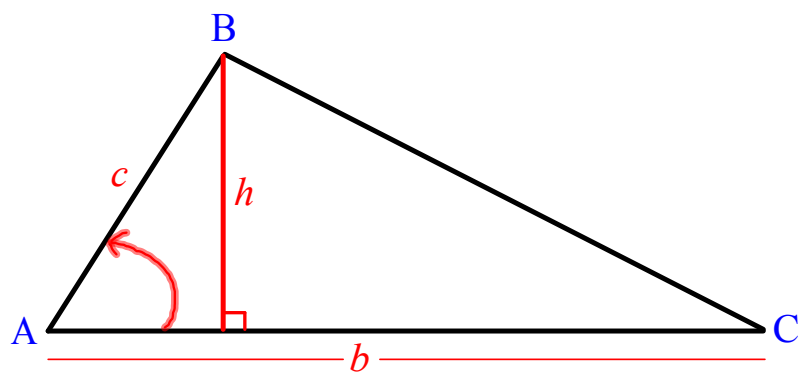
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Theorem 9-1

L9.5

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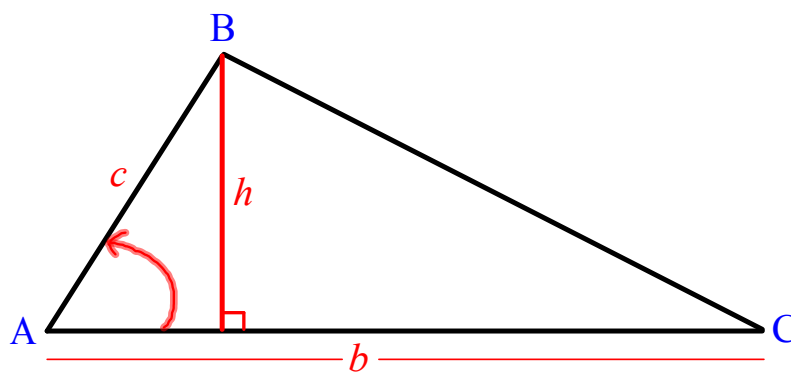


Theorem 9-1

L9.5

What is the formula for the area of any Δ given SAS info?

$$\sin A = \frac{h}{c}$$

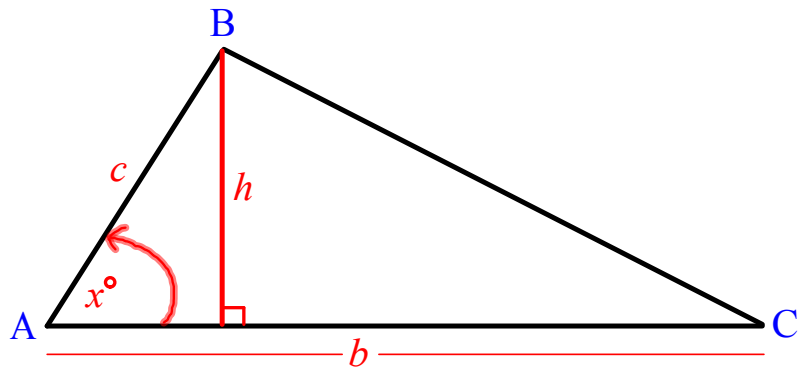


Theorem 9-1

L9.5

What is the formula for the area of any Δ given SAS info?

$$\sin A = \frac{h}{c}$$
$$h = c \cdot \sin A$$

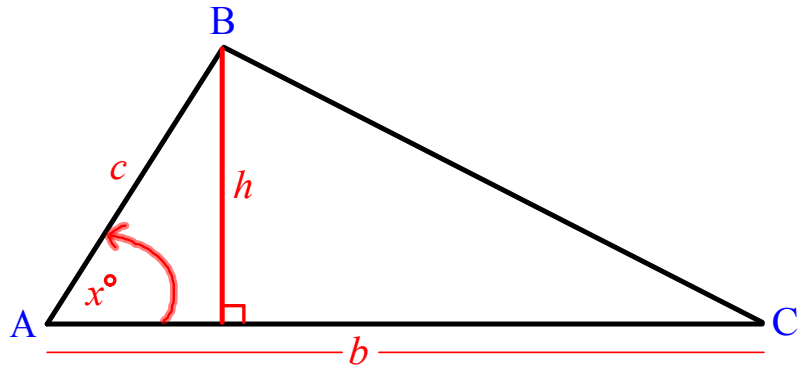


Theorem 9-1

L9.5

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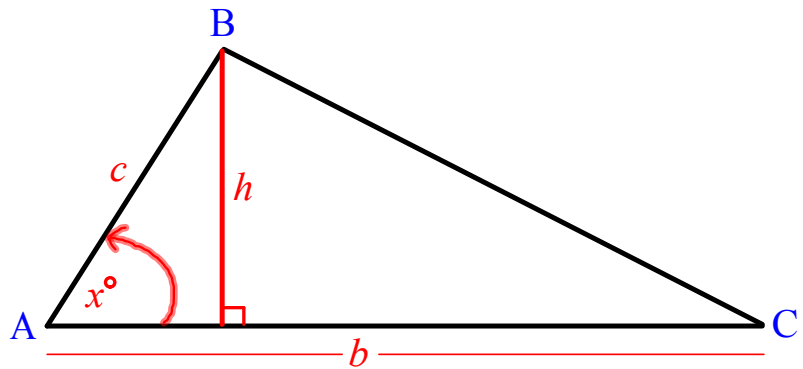
$$\sin A = \frac{h}{c}$$
$$h = c \cdot \sin A$$
$$\text{area}_{\Delta} = \frac{1}{2}bh$$



Theorem 9-1 Area of a Δ given SAS info L9.5

What is the formula for the area of any Δ given SAS info?

$$\begin{aligned}\sin A &= \frac{h}{c} \\ h &= c \cdot \sin A \\ \text{area}_{\Delta} &= \frac{1}{2}bh\end{aligned}$$



$$\text{area}_{\Delta} = \frac{1}{2} \cdot b \cdot c \cdot \sin A$$

Practice

L9.5

pg 501 #11-13

HW problems

L9.5

Pg 500 #1-18, 20-27