

DATE:

ESSENTIAL QUESTION(S): How do you find the area of a non-right triangle using given information?

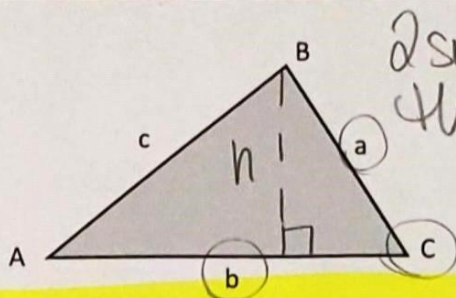
REVIEW:

Here is a video for this section.



NOTES:

Area of a triangle



2 sides and the included \neq

$$A = \frac{1}{2} \cdot b \cdot c \cdot \sin A \quad A = \frac{1}{2} \cdot a \cdot c \cdot \sin B \quad A = \frac{1}{2} \cdot a \cdot b \cdot \sin C$$

Example 1:

Find the area of $\triangle ABC$ given two sides and the included side(SAS) to the nearest tenth.

a. $a = 8, b = 9, C = 104^\circ$

b. $A = 31^\circ, b = 18, c = 22$

$$A = \frac{1}{2}(8)(9)\sin 104$$

$$A = \frac{1}{2}(18)(22)\sin(31)$$

$$A = 34.9 \text{ units}^2$$

$$A = 102.0$$

Try on your own:

1. $C = 25^\circ, a = 4, b = 7$

2. $B = 92^\circ, a = 14.5, c = 9$

3. $A = 138^\circ, b = 10, c = 20$

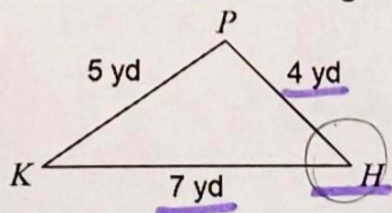
4. $C = 116^\circ, a = 2.7, b = 4.6$

5. $a = 14, b = 18, C = 36^\circ$

6. $C = 45^\circ, a = 5, b = 6$

Example 2:

Find the area of a triangle given three sides.



$$H = 44^\circ \quad K = \quad P =$$

$$h = 5 \quad k = 4 \quad p = 7$$

$$5^2 = 4^2 + 7^2 - 2(4)(7)\cos H$$

$$25 = 65 - 56\cos H$$

$$-40 = -56\cos H \quad \cos H = \frac{5}{7}$$

$$A = \frac{1}{2}(4)(7)\sin 44$$

$$A = 9.73 \text{ yd}^2$$

What we want

two sides with the non corresponding \neq .

Step by step

① used Law of Cosines to find an \neq

② find the area using the \neq & adjacent sides.

Try on your own:

1. $a = 11, b = 8, c = 13$

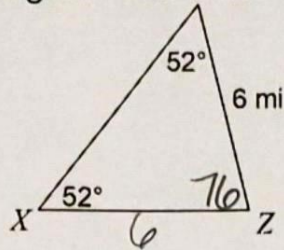
2. $x = 16, y = 6, z = 12$

3. $a = 6, b = 11, c = 14$

4. $a = 16, b = 8, c = 9.4$

Example 3:

Find the area of the triangle given a combination of sides and angles. Round the to the nearest tenth.

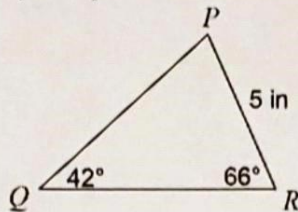


$X = 52 \quad Y = 52 \quad Z = 76$
 $x = 6 \quad y = 6 \quad z =$

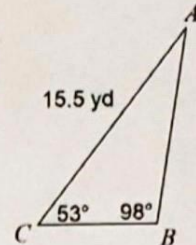
$A = \frac{1}{2}(6)(6)\sin 76 = 17.47 \text{ mi}^2$

Try on your own:

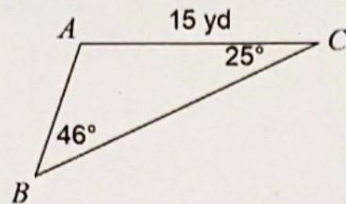
1.



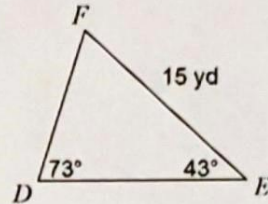
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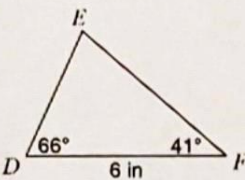
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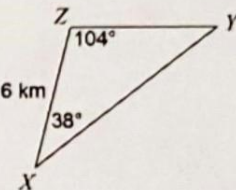
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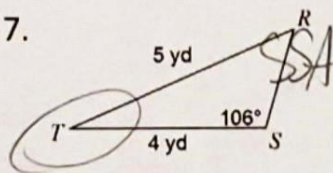
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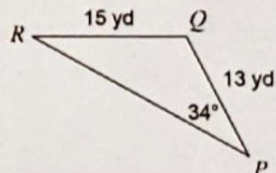
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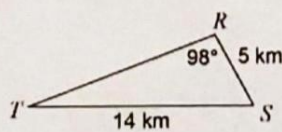
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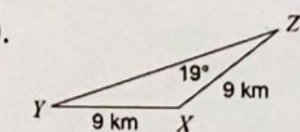
8.



9.



10.



(7) $R = 50 \quad S = 106 \quad T = 24$
 $r = 4 \quad s = 5 \quad t =$
 $\frac{\sin 106}{5} = \frac{\sin R}{4}$
 $\sin R = 0.7690$
 $R = 50^\circ$
 $A = \frac{1}{2}(5)(4)\sin 50$
 $A = 7.66 \text{ yd}^2$