

Thursday, April 05, 2018  
7:30 PM

**Precalculus**

Name \_\_\_\_\_

**Review #1 for Quarterly – Quarter 3 Addendum**

SHOW ALL WORK on SEPARATE sheet of paper. Solve the following problems. Unless otherwise specified, round **final** answers to the nearest **tenth**.

**Section 6.1**

19. Find the **number** of triangles with the given information – do **not** solve the triangles.
- i)  $A = 42^\circ$ ,  $a = 5$ ,  $b = 7$
  - ii)  $A = 173^\circ$ ,  $a = 9$ ,  $b = 9.1$
  - iii)  $R = 73^\circ$ ,  $r = 8$ ,  $t = 8$
20. Given triangle ABC with  $A = 41^\circ$ ,  $B = 72^\circ$ , and  $a = 15$ , find  $c$ . Round **final** answers to the nearest **hundredth**.
21. Given triangle ABC with  $B = 56^\circ$ ,  $a = 98$ , and  $b = 85$ , solve the triangle. Round **final** answers to the nearest **hundredth**.
22. Given triangle ABC with  $A = 71^\circ$ ,  $b = 10$ , and  $c = 19$ , find the area of the triangle. Round **final** answers to the nearest **hundredth**.
23. From fire tower A, a fire with a bearing of  $N 78^\circ E$  is sighted. The same fire is sighted from fire tower B at a bearing of  $N 51^\circ W$ . Tower B is 70 miles due east of tower A. What is the distance from tower A to the fire?

**Review #2 for Quarterly – Quarter 3 Addendum**

**Chapter 6: [Answers on Back]**

1. Solve each triangle using the Law of Sines. Round all answers to the nearest thousandth.
- a.  $A = 40^\circ$ ,  $B = 12^\circ$ ,  $b = 100$
  - b.  $C = 150^\circ$ ,  $a = 5$ ,  $c = 20$
2. Find the area of the triangle:  $a = 3$ ,  $b = 6$ ,  $C = 130^\circ$
3. Determine the number of solutions to the triangle:  $a = 10$ ,  $b = 35$ ,  $A = 22.5^\circ$

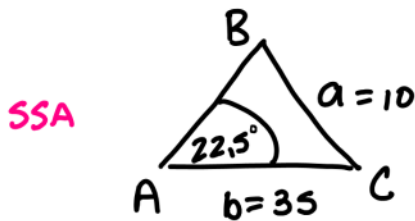
Chapter 6:

- 1a.  $C = 128^\circ$   
 $a \approx 309.164$   
 $c \approx 379.012$
- b.  $A \approx 7.181^\circ$   
 $B \approx 22.819^\circ$   
 $b \approx 15.513$

2.  $6.894 \text{ units}^2$

3. no solution – not in the range of sine

3. Determine the number of solutions to the triangle:  $a = 10$ ,  $b = 35$ ,  $A = 22.5^\circ$



\* given acute angle  
\* can have 0, 1, or 2  
solutions

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{10}{\sin 22.5^\circ} = \frac{35}{\sin B}$$

$$\sin B = \frac{35 \sin 22.5^\circ}{10}$$

$$\sin^{-1}\left(\frac{35 \sin 22.5^\circ}{10}\right) = B$$

\* error: domain

no solution

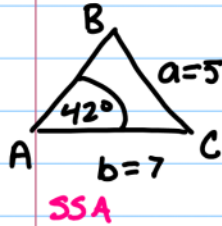
↑  
1.339  
not in the range  
of sine

Review #1 for Quarterly – Quarter 3 Addendum

19. Find the **number** of triangles with the given information – do **not** solve the triangles.

i)  $A = 42^\circ, a = 5, b = 7$

**SSA**



1st Triangle  $\frac{a}{\sin A} = \frac{b}{\sin B}$

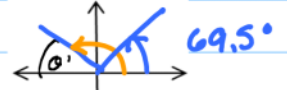
$$\frac{5}{\sin 42^\circ} = \frac{7}{\sin B}$$

$$\sin B = \frac{7 \sin 42^\circ}{5} \approx 0.937$$

$$\sin^{-1}\left(\frac{7 \sin 42^\circ}{5}\right) = B$$

$B \approx 69.5^\circ$

2nd Triangle



$B \approx 110.5^\circ$   $B = 180^\circ - 69.5^\circ = 110.5^\circ$

$C = 180^\circ - A - B$

$C = 180^\circ - 42^\circ - 110^\circ$

$C = 28^\circ$

**TWO TRIANGLES**

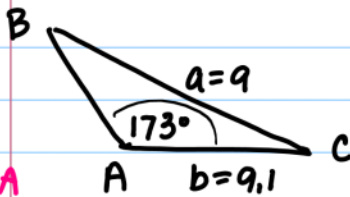
\* Given an acute angle

\* 1, 2, or 0 solutions

ii)  $A = 173^\circ, a = 9, b = 9.1$

\* Given obtuse angle

\* 1 or 0 solutions



**SSA**

$\frac{a}{\sin A} = \frac{b}{\sin B}$

$$\frac{9}{\sin 173^\circ} = \frac{9.1}{\sin B}$$

$$\sin B = \frac{9.1 \sin 173^\circ}{9}$$

$$\sin^{-1}\left(\frac{9.1 \sin 173^\circ}{9}\right) = B$$

$B \approx 7.1^\circ$

$C = 180^\circ - A - B$

$C = 180^\circ - 173^\circ - 7.1^\circ$

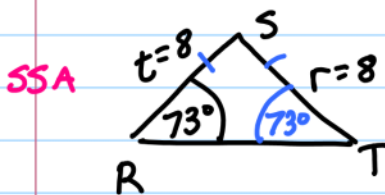
$C = -1 \leftarrow$  not possible

**0 TRIANGLES**

iii)  $R = 73^\circ, r = 8, t = 8$

\* Given acute angle

\* 1, 2 or 0 solutions



**SSA**

1st Triangle!

$T = 73^\circ$

**1 TRIANGLE**

2nd Triangle

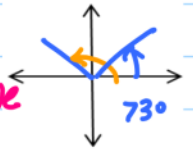
$T = 180^\circ - 73^\circ$

$T = 107^\circ$

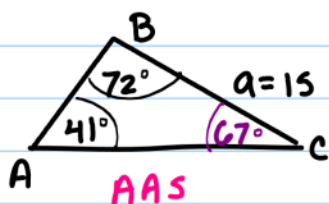
$S = 180^\circ - R - T$

$S = 180^\circ - 73^\circ - 107^\circ$

$S = 0 \leftarrow$  not possible



20. Given triangle ABC with  $A = 41^\circ$ ,  $B = 72^\circ$ , and  $a = 15$ , find  $c$ . Round **final** answers to the nearest hundredth.



$$C = 180^\circ - A - B$$

$$C = 180^\circ - 41^\circ - 72^\circ$$

$$C = 67^\circ$$

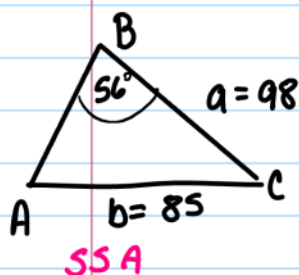
$$\frac{a}{\sin A} = \frac{c}{\sin C}$$

$$\frac{15}{\sin 41^\circ} = \frac{c}{\sin 67^\circ}$$

$$c = \frac{15 \sin 67^\circ}{\sin 41^\circ}$$

$$c = 21.05$$

21. Given triangle ABC with  $B = 56^\circ$ ,  $a = 98$ , and  $b = 85$ , solve the triangle. Round **final** answers to the nearest hundredth.



\* given acute angle  
\* 2, 1, or 0 solutions

1st Triangle

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{98}{\sin A} = \frac{85}{\sin 56^\circ}$$

$$\sin A = \frac{98 \sin 56^\circ}{85}$$

$$\sin^{-1}\left(\frac{98 \sin 56^\circ}{85}\right) = A$$

$$A \approx 72.91^\circ$$

$$C = 180^\circ - A - B$$

$$C = 180^\circ - 72.91^\circ - 56^\circ$$

$$C \approx 51.09^\circ$$

$$\frac{c}{\sin C} = \frac{b}{\sin B}$$

$$\frac{c}{\sin 51.09^\circ} = \frac{85}{\sin 56^\circ}$$

$$c = \frac{85 \sin 51.09^\circ}{\sin 56^\circ}$$

$$c = 79.78$$

2nd Triangle

$$A = 180^\circ - 72.91^\circ$$

$$A = 107.09^\circ$$

$$C = 180^\circ - A - B$$

$$C = 180^\circ - 107.09^\circ - 56^\circ$$

$$C = 16.91^\circ$$

$$\frac{c}{\sin C} = \frac{b}{\sin B}$$

$$\frac{c}{\sin 16.91^\circ} = \frac{85}{\sin 56^\circ}$$

$$c = \frac{85 \sin 16.91^\circ}{\sin 56^\circ}$$

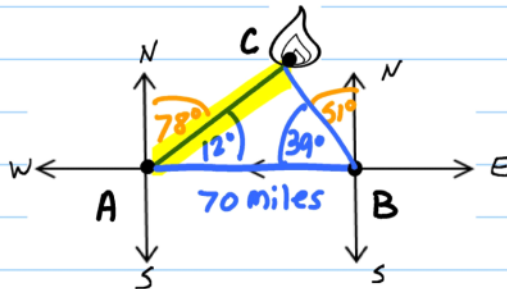
$$c = 29.82$$

22. Given triangle ABC with  $A = 71^\circ$ ,  $b = 10$ , and  $c = 19$ , find the area of the triangle. Round **final** answers to the nearest **hundredth**.

$$A = \frac{1}{2}bc \sin A \quad A = \frac{1}{2}(10)(19) \sin 71^\circ$$

$$A = 89.82 \text{ sq units}$$

23. From fire tower A, a fire with a bearing of  $N 78^\circ E$  is sighted. The same fire is sighted from fire tower B at a bearing of  $N 51^\circ W$ . Tower B is 70 miles due east of tower A. What is the distance from tower A to the fire?



$$A = 90^\circ - 78^\circ \quad B = 90^\circ - 51^\circ$$

$$A = 12^\circ \quad B = 39^\circ$$

$$C = 180^\circ - A - B$$

$$C = 180^\circ - 12^\circ - 39^\circ$$

$$C = 129^\circ$$

$$\frac{c}{\sin C} = \frac{b}{\sin B}$$

$$\frac{70}{\sin 129^\circ} = \frac{b}{\sin 39^\circ}$$

$$b = \frac{70 \sin 39^\circ}{\sin 129^\circ} \quad b = 56.68 \text{ miles}$$

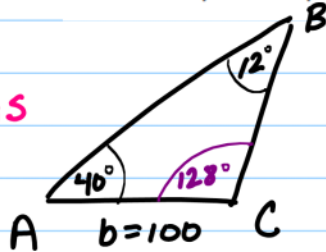
Review #2 for Quarterly – Quarter 3 Addendum

Chapter 6: [Answers on Back]

1. Solve each triangle using the Law of Sines. Round all answers to the nearest thousandth.

a.  $A = 40^\circ, B = 12^\circ, b = 100$

AAS



$$C = 180^\circ - A - B$$

$$C = 180^\circ - 40^\circ - 12^\circ$$

$$C = 128^\circ$$

$$\frac{b}{\sin B} = \frac{a}{\sin A}$$

$$\frac{100}{\sin 12^\circ} = \frac{a}{\sin 40^\circ}$$

$$a = \frac{100 \sin 40^\circ}{\sin 12^\circ}$$

$$a = 309.164$$

$$\frac{b}{\sin B} = \frac{c}{\sin C}$$

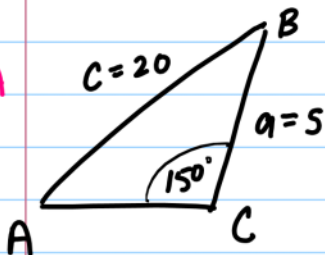
$$\frac{100}{\sin 12^\circ} = \frac{c}{\sin 128^\circ}$$

$$c = \frac{100 \sin 128^\circ}{\sin 12^\circ}$$

$$c = 379.012$$

b.  $C = 150^\circ, a = 5, c = 20$

SSA



\* Given obtuse angle

\* 1 or 0 Solutions

$$\frac{c}{\sin C} = \frac{a}{\sin A}$$

$$\frac{20}{\sin 150^\circ} = \frac{5}{\sin A}$$

$$\sin A = \frac{5 \sin 150^\circ}{20}$$

$$\sin A = \frac{5 \sin 150^\circ}{20}$$

$$\sin^{-1}\left(\frac{5 \sin 150^\circ}{20}\right) = A$$

$$A \approx 7.181^\circ$$

$$B = 180^\circ - A - C$$

$$B = 180^\circ - 7.181^\circ - 150^\circ$$

$$B \approx 22.819^\circ$$

$$\frac{c}{\sin C} = \frac{b}{\sin B}$$

$$\frac{20}{\sin 150^\circ} = \frac{b}{\sin 22.819^\circ}$$

$$b = \frac{20 \sin 22.819^\circ}{\sin 150^\circ}$$

$$b \approx 15.513$$

2. Find the area of the triangle:  $a = 3, b = 6, C = 130^\circ$

$$A = \frac{1}{2} ab \sin C$$

$$A = \frac{1}{2} (3)(6) \sin 130^\circ = 6.894 \text{ sq units}$$