GSE PreCalculus: Unit 6: Law of Cosines/Law of Sines
Unit 6 Review – Digital Learning

Name Key

Solve the following oblique triangles using law of sines or cosines. Find all missing angle measures and side measures to the nearest tenth.

1. a= 27, b= 35, $\angle C = 71°$ Law of Cosines – all letters diff

A = 44.3° a = 27
B = 64.7° b = 35
C = 71 c = 36.6

~~A = _____ a = 27~~
~~B = _____ b = 35~~
~~C = 71 c = _____~~

Since used LoC to start, no need to check for 2nd △

$c^2 = a^2 + b^2 - 2ab\cos C$
$c^2 = 27^2 + 35^2 - 2(27)(35)\cos 71$
$c^2 = 1338.68$
$c = 36.6$

$\frac{\sin 71}{36.6} = \frac{\sin B}{35}$ Solve for B 1st b/c it is larger
$\frac{35\sin 71}{36.6} = \frac{36.6\sin B}{36.6}$
$.904 = \sin B$
$\sin^{-1}(.904) = B$

$A = 180 - 71 - 64.7$

2. a = 5, b = 4, c = 7 Law of Cosines – all letters diff

A = 44.4 a = 5
B = 34.1 b = 4
C = 101.5 c = 7

~~A = _____ a = 5~~
~~B = _____ b = 4~~
~~C = _____ c = 7~~

$c^2 = a^2 + b^2 - 2ab\cos C$ solve for C 1st b/c it is largest
$7^2 = 5^2 + 4^2 - 2(5)(4)\cos C$
$49 = 41 - 40\cos C$
$-41 \quad -41$
$\frac{8}{-40} = \frac{-40\cos C}{-40}$
$-.20 = \cos C$
$\cos^{-1}(-.20) = C$
$101.5 = c$

$\frac{\sin 101.5}{7} = \frac{\sin A}{5}$
$\frac{5\sin 101.5}{7} = \frac{7\sin A}{7}$
$.70 = \sin A$
$\sin^{-1}(.70) = A$

$B = 180 - 101.5 - 44.4$

3. $\angle B = 130°$, b = 5.2, c = 10.1

A = _____ a = _____
B = 130 b = 5.2
C = _____ c = 10.1

A = _____ a = _____
B = 130 b = 5.2
C = _____ c = 10.1

Law of sines – common letters B and b

$\frac{\sin C}{10.1} = \frac{\sin 130}{5.2}$
$\frac{5.2\sin C}{5.2} = \frac{10.1\sin 130}{5.2}$
$\sin C = 1.49$
$C = \sin^{-1}(1.49)$
No solution

No triangle

4. $\angle A = 73°$, b= 12.8, a= 12.5 Law of Sines – Aorda

A = 73 a = 12.5
B = 78.3 b = 12.8 $\rightarrow$ 180 – 78.3
C = 28.7 c = 6.3

A = 73 a = 12.5
B = 101.7 b = 12.8
C = 5.3 c = 1.2

Need to check for 2nd △ b/c given 2 sides, 1∠ and using Law of Sines to start problem

$\frac{\sin B}{12.8} = \frac{\sin 73}{12.5}$
$\frac{12.5\sin B}{12.5} = \frac{12.8\sin 73}{12.5}$
$\sin B = .98$
$B = \sin^{-1}(.98)$
$B = 78.3$

$\frac{\sin 5.3}{c} = \frac{\sin 73}{12.5}$
$c = 1.2$

$\frac{\sin 28.7}{c} = \frac{\sin 73}{12.5}$
$c = 6.3$

5. $\angle A = 150°$, b= 10, a= 64

A = 150 a = 64
B = 4.5 b = 10 $\rightarrow$ 180 – 4.5
C = 25.5 c = 55.1

~~A = 150 a = 64~~
~~B = 175.5 b = 10~~
~~C = –145.5 c = _____~~

C = –145.5 Can't have negative angle

Law of sines – Aorda; must check for 2nd △ b/c given 2 sides, 1∠ angle

$\frac{\sin 150}{64} = \frac{\sin B}{10}$
$\frac{10\sin 150}{64} = \frac{64\sin B}{64}$
$.078 = \sin B$
$\sin^{-1}(.078) = B$
$4.5 = B$

$\frac{\sin 25.5}{c} = \frac{\sin 150}{64}$
$\frac{64\sin 25.5}{\sin 150} = \frac{c\cancel{\sin 150}}{\cancel{\sin 150}}$
$55.1 = c$

6. $\angle A = 27.3°$, b= 32.9, a= 27.4

A = 27.3° a = 27.4
B = 33.4 b = 32.9 $\rightarrow$ 180 – 33.4
C = 119.3 c = 52.1

A = 27.3° a = 27.4
B = 146.6 b = 32.9
C = 6.1 c = 6.4

Law of sines – must check for 2nd △

$\frac{\sin 27.3}{27.4} = \frac{\sin B}{32.9}$
$\frac{32.9\sin 27.3}{27.4} = \frac{27.4\sin B}{27.4}$
$.55 = \sin B$
$\sin^{-1}(.55) = B$
$33.4 = B$

$\frac{\sin 6.1}{c} = \frac{\sin 27.3}{27.4}$
$c = 6.4$

$\frac{\sin 119.3}{c} = \frac{\sin 27.3}{27.4}$
$c = 52.1$