Name Key Date _____ Hour _____

6.1,6.2,6.6,6.7 Quiz Review

Find each specified vector or scalar. Given: u=2i-5j, v=-3i+7j, and w=-i-6j

1) v-w $(-3+{}^{+}1)i+(7+{}^{+}6)j$

$-2i+13j$

2) 6v $6(-3i+7j)$

$-18i+42j$

3) $\|-2\boldsymbol{v}\|$

$|-2|\,\|v\|$

$2\cdot\sqrt{(-3)^2+(7)^2}$

$2\sqrt{9+49}$

$2\sqrt{58}$ or 15.23

4) $\boldsymbol{v}\cdot\boldsymbol{w}$

$-3(-1)+(7)(-6)$

$3+(-42)$

-39

5) Find the angle between vector v and vector w. Complete each step.

$\boldsymbol{u}\cdot\boldsymbol{w}=$

$2(-1)+(-5)(-6)$

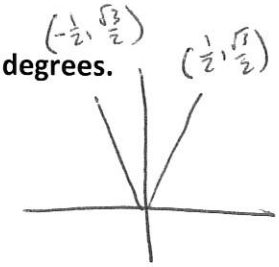
$-1+30=\boxed{29}$

$\|\boldsymbol{u}\| = \sqrt{2^2+(-5)^2}=\sqrt{4+25}=\sqrt{29}$

$\|\boldsymbol{w}\| = \sqrt{(-1)^2+(-6)^2}=\sqrt{1+36}=\sqrt{37}$

$\boldsymbol{\theta} = \cos^{-1}\left(\frac{29}{\sqrt{29}\sqrt{37}}\right)=27.7^\circ$

6) Find the vector v in terms of i and j whose magnitude is 8 and angle is 120 degrees.



$V=8\cos 120^\circ i+8\sin 120^\circ j$

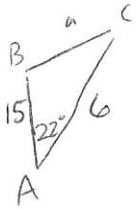
$8(-\frac{1}{2})i+8(\frac{\sqrt{3}}{2})j$

$V=-4i+4\sqrt{3}j$

Name _____ Date _____ Hour _____

For each of the following, solve the triangle. Be sure to solve for both triangles if it is an ambiguous case.

SAS



7. $A = 22°, b = 6, c = 15$

$a^2 = 15^2 + 6^2 - 2(15)(6)\cos 22$

$a^2 = 225 + 36 - 166.89$

$a = \sqrt{94.11}$

$a = 9.7$

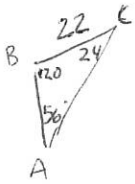
$\frac{\sin 22}{9.7} = \frac{\sin B}{6}$ (0.37)

$B = \sin^{-1}(0.25) = 14.5°$

$180 - (22 + 14.5) = 143.5$

Law of cosines — Only 1 Δ for SAS

$a_1 = 9.7$	$m\angle A_1 = 22°$	$a_2 =$ ___	$m\angle A_2 =$ ___
$b_1 = 6$	$m\angle B_1 = 14.5°$	$b_2 =$ ___	$m\angle B_2 =$ ___
$c_1 = 15$	$m\angle C_1 = 143.5°$	$c_2 =$ ___	$m\angle C_2 =$ ___



8. $A = 56°, C = 24°, a = 22$

$\frac{\sin 56°}{22} = \frac{\sin 24}{c}$ (0.83, 0.41)

$c = 10.9$

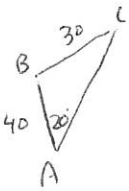
$\frac{\sin 56}{22} = \frac{\sin 120}{b}$ (0.83, 0.87)

$b = 23.1$

Law of Sines — Only 1 Δ for AAS

$a_1 = 22$	$m\angle A_1 = 56°$	$a_2 =$ ___	$m\angle A_2 =$ ___
$b_1 = 10.9$	$m\angle B_1 = 120°$	$b_2 =$ ___	$m\angle B_2 =$ ___
$c_1 = 23.1$	$m\angle C_1 = 24°$	$c_2 =$ ___	$m\angle C_2 =$ ___

*SSA



9. $A = 20°, a = 30, c = 40$

$\frac{\sin 20}{30} = \frac{\sin C}{40}$ (0.34)

$C = \sin^{-1}(0.45)$

$C = 26.7°$

$\frac{\sin 20°}{30} = \frac{\sin 133.3}{b_1}$ (0.34, 0.73)

$b_1 = 64.4$

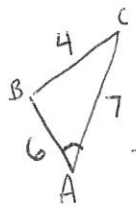
$\frac{\sin 20°}{30} = \frac{\sin 6.7°}{b_2}$ (0.34, 0.12)

$b_2 = 10.6$

Law of Sines (Ambiguous Case) Possible 2 Δ prob. for SSA

$a_1 = 30$	$m\angle A_1 = 20°$	$a_2 = 30$	$m\angle A_2 = 20°$
$b_1 = 64.4$	$m\angle B_1 = 133.3°$	$b_2 = 10.6$	$m\angle B_2 = 6.7°$
$c_1 = 40$	$m\angle C_1 = 26.7°$	$c_2 = 40$	$m\angle C_2 = 153.3°$

Check for $\angle C_2$ → $180 - 26.7 = 153.3$ + mLA = + 20 = 173.3



10. a=4, b=7, c=6

$4^2 = 7^2 + 6^2 - 2(7)(6)\cos A$

$16 = 49 + 36 - 84\cos A$

$16 = 85 - 84\cos A$

$-85 \quad -85$

$\frac{-69}{-84} = \frac{-84\cos A}{-84}$

$\cos A = 0.82$

$A = \cos^{-1}(0.82) = 34.9°$

$\frac{\sin 34.9}{4} = \frac{\sin C}{6}$ (0.57)

$C = \sin^{-1}(0.86) = 59.3°$

$180 - (34.9 + 59.3) =$

Law of Cosines SSS — Only 1 Δ

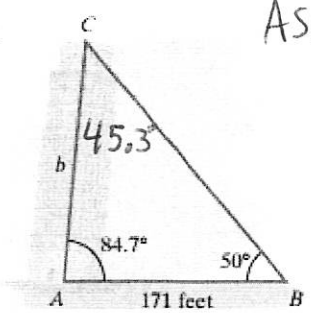
$a_1 = 4$	$m\angle A_1 = 34.9°$	$a_2 =$ ___	$m\angle A_2 =$ ___
$b_1 = 7$	$m\angle B_1 = 85.8°$	$b_2 =$ ___	$m\angle B_2 =$ ___
$c_1 = 6$	$m\angle C_1 = 59.3°$	$c_2 =$ ___	$m\angle C_2 =$ ___

11. The Leaning Tower of Pisa in Italy leans at an angle of about 84.7 degrees. The figure shows that 171 feet from the base of the tower, the angle of elevation to the top is 50 degrees. Find the distance, to the nearest tenth of a foot, from the base to the top of the tower. T

ASA

$180 - (84.7 + 50)$

$45.3°$



$\frac{\sin 50°}{b} = \frac{\sin 45.3°}{171}$ (0.77, 0.71)

$b = 185.5$ ft