50 points total

$\bar{x} = 69.37$
$s_x = 20.64$
32, 60, 68, 88, 100

MAC1114 Test 1
Deborah Howard (3-16)

Name Key

Show all work for credit.

2 each

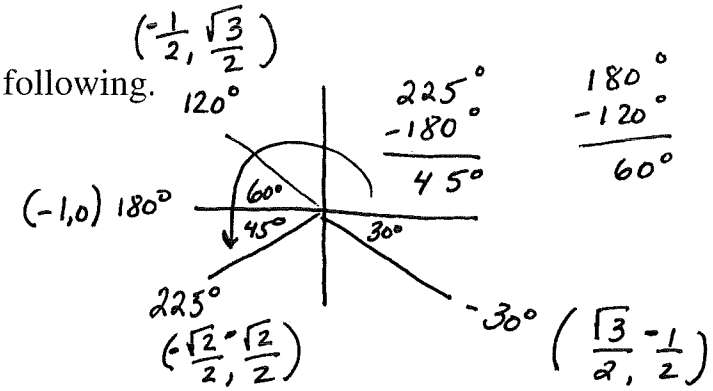
1. Find the **exact** value for each of the following.

$\sin(225°) = -\frac{\sqrt{2}}{2}$

$\sec(-30°) = \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2}{\sqrt{3}}$

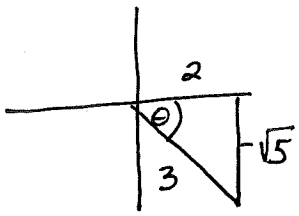
$\csc(180°) = \frac{1}{0} = \emptyset$ = undefined

$\cos(120°) = -\frac{1}{2}$



2. Find the exact value of the other five trigonometric functions given $\cos\theta = \frac{2}{3}$ where θ is in quadrant IV.

A
IV



$2^2 + y^2 = 3^2$
$4 + y^2 = 9$
$\sqrt{y^2} = \sqrt{5}$
$y = \pm\sqrt{5}$

$\sin\theta = \frac{-\sqrt{5}}{3}$

$\tan\theta = \frac{-\sqrt{5}}{2}$

$\sec\theta = \frac{3}{2}$

$\csc\theta = \frac{-3}{\sqrt{5}}$

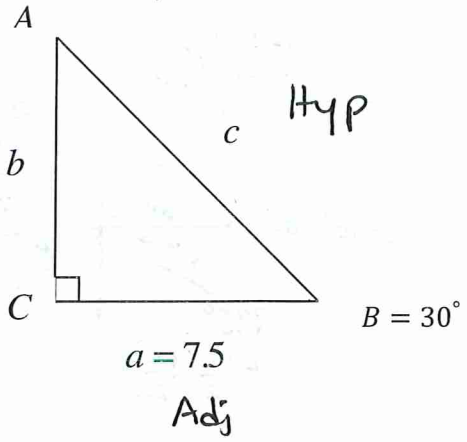
$\cot\theta = \frac{2}{-\sqrt{5}}$

3. Determine the missing sides and angles of the right triangle shown below.

2each

$180° - 30° - 90° = 60° = A$

$30°\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$



opp

Hyp

Adj

$A = 60°$
$C = 90°$
$b = 4.3$
$c = 8.7$

$\frac{5\sqrt{3}}{2}$

$5\sqrt{3}$

$\cos 30° = \frac{\sqrt{3}}{2} = \frac{7.5}{c}$

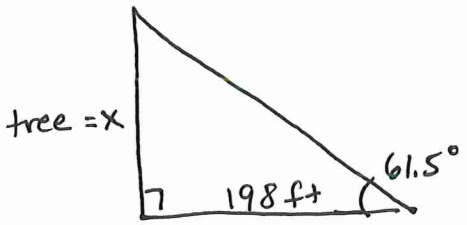
$c = \frac{7.5(2)}{\sqrt{3}} = 8.660254038$

$\tan 30° = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \frac{b}{7.5}$

$b = \frac{7.5}{\sqrt{3}} = 4.330127019$

4. According to *The Guiness Book of World Records*, the tallest tree currently standing is the Mendocino Tree in California. At a distance of 198 feet from the base of the tree, the angle of elevation to the top of the tree is 61.5 degrees. How tall is the tree? Use significant digits for rounding.

(4)



opp

Shadow

Adj

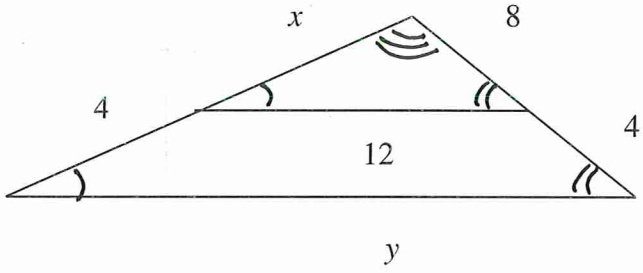
$\tan 61.5° = \frac{x}{198}$

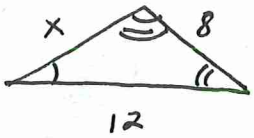
$x = 198 \tan 61.5° = 364.6706354$

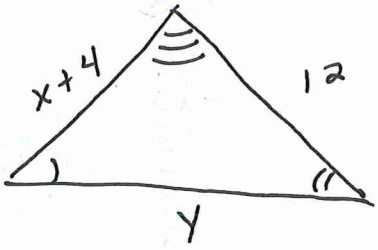
365ft

5. Find x and y in the figure where the side that measures 12 and the side that measures y are parallel lines.

(Leah)







$\frac{8}{12} = \frac{12}{y}$

$y = \frac{12(12)}{8} = 18$

$y = 18$

$\frac{x}{x+4} = \frac{8}{12}$

$12x = 8x + 32$

$4x = 32$

$x = 8$

Similar Δs since // corresponding $\angle$ congruent

6. The bearing from A to C is $S\ 52°E$ and the bearing from A to B is $N\ 84°E$.

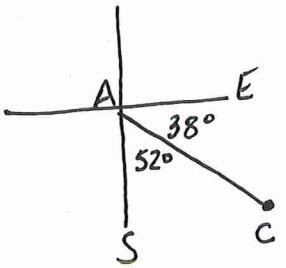
The bearing from B to C is $S\ 38°W$. A plane flying at 248 mph takes 2.4 hours to go from A to B. Find the distance from A to C.

(8)

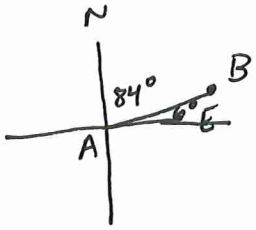
$248(2.4) = 595.2$

4 digits

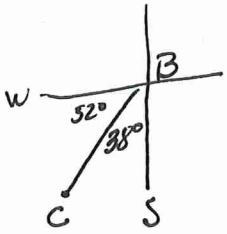
S 52° E

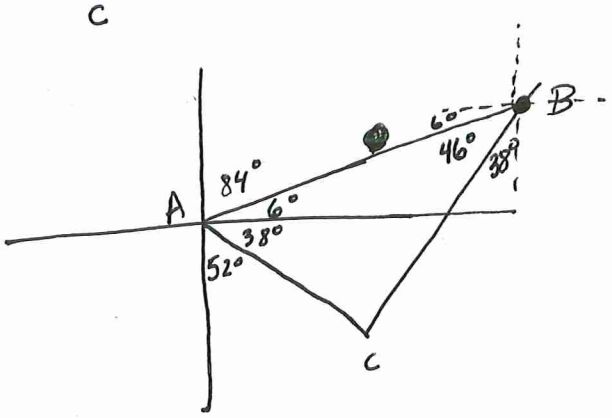


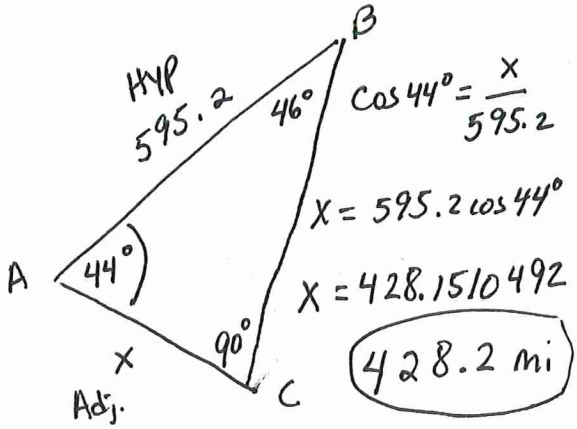
N 84° E



S 38° W







$\cos 44° = \frac{x}{595.2}$

$x = 595.2 \cos 44°$

$x = 428.1510492$

428.2 mi

7. Use only EXACT values unless specified.

2 each

$\sec\frac{\pi}{6} = \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2}{\sqrt{3}}$

$\cos\frac{2\pi}{3} = -\frac{1}{2}$

$\sin\frac{-23\pi}{4} = \frac{\sqrt{2}}{2}$

$\tan\frac{11\pi}{3} = \frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = -\sqrt{3}$