**Math 1316 – Trigonometry** ***Exam* 1** ***Review***

*Instructor*: Fred Khoury

**1.** Convert the angle to decimal degrees and round to the nearest hundredth of a degree.

*a)* $74° 8' 14''$ *b*) $34° 51' 35''$ *c*) $274° 18' 59''$

**2.** Convert the angle to degrees, minutes, and seconds.

*a)* $34.817°$ *b*) $59.0854°$ *c*) $89.9004°$

**3.** If $\cos\theta = \frac{2}{3}$ and $\theta$ terminates in quadrant IV, find $\tan\theta$ and $\csc\theta$.

**4.** If $\csc\theta = -\frac{13}{5}$ and $\theta$ terminates in quadrant III, find $\cot\theta$

**5.** If $\sin\theta = \frac{12}{13}$ and $\theta$ terminates in QII, find each of the following:

*a*) $\cos\theta$ *b*) $\cot\theta$ *c*) $\csc\theta$

**6.** If the terminal ray of an angle $\theta$ contains $(4,-2)$, find the exact values of:

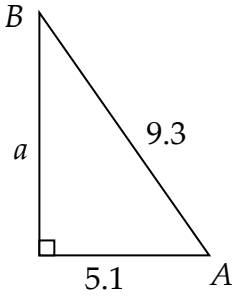
*a*) $\sin\theta$ *b*) $\sec\theta$ *c*) $\tan\theta$ *d*) $\cos^2\theta$

**7.** Find the measures of the missing sides and angles of the right triangle shown below.

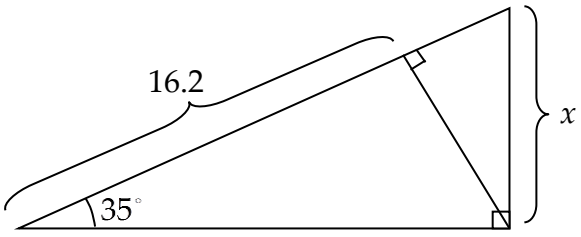
$a$ = _____

$A$ = _____

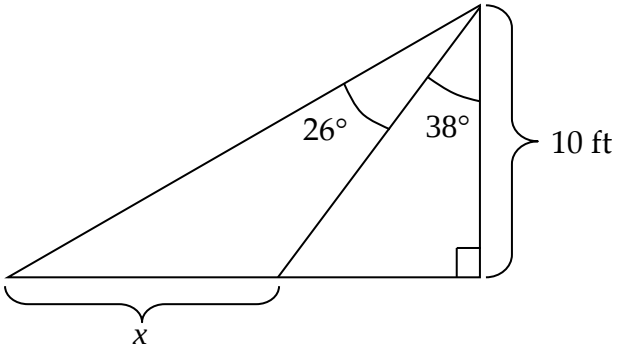
$B$ = _____



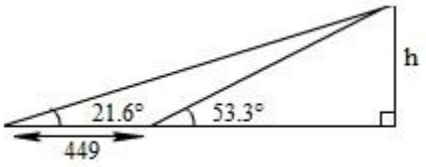

**8.** Find the value of $x$ for the indicated figure



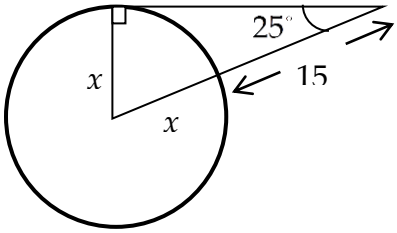
**9.** Find the value of $x$ for the indicated figure



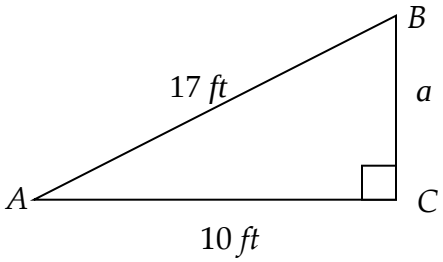

**10.** Find ***h*** as indicated in the figure.



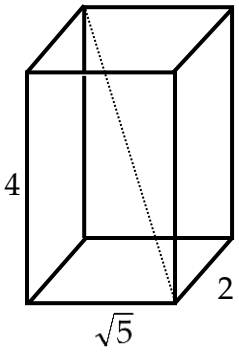

**11.** Solve for $x$ in the indicated figure:




**12.** Find the missing sides and angles in the right triangle shown below:



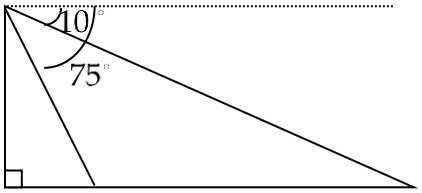

**13.** Find the length of the diagonal of the rectangular box shown below:



**14.** A ship travels for 25 miles at a bearing of S 13° E. It then changes direction and travels for 16 more miles at a bearing of N 77° E. Determine the ship's distance and bearing from its starting point.

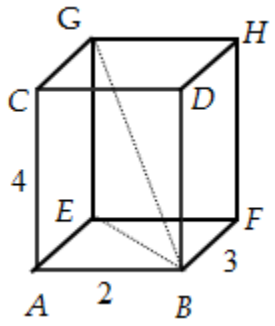
**15.** An 18 foot ladder is placed against a building so that its lower end is 3.5 feet from the base of the building. What angle does the ladder make with the ground?

**16.** From an airplane flying at 38,000 feet above the ground, a pilot sees two towns along a line directly below the path of the plane. The angles of depression to the towns are $10^\circ$ and $75^\circ$. How many *miles* apart are the towns?




**17.** Consider the 3-dimensional figure shown below. Find each of the following:

*a)* the length of BE.
*b)* the length of BG.
*c)* the angle between BE and BG, rounded to the nearest tenth of a degree.




**18.** Perform the indicated operations and simplify the result.

*a)* $\csc x\left(\sin x + \cos x\right)$

*b)* $\tan^2 x \ \csc^2 x$

*c)* $\dfrac{\sin\alpha}{\cos\alpha} + \dfrac{\cos\alpha}{\sin\alpha}$

*d)* $\dfrac{\sin\alpha}{1+\sin\alpha} + \dfrac{\sin\alpha}{1-\sin\alpha}$

**19.** Simplify the expression $\sqrt{25-x^2}$ as much as possible after substituting $5\sin\theta$ for $x$

# *Answers*

**1.** *a*) 74.137° *b*) 34.86° *c*) 274.32°

**2.** *a*) 34° 49′ 1.2″ *b*) 59° 5′ 7″ *c*) 89° 54′ 1″

**3.** $\tan\theta = -\frac{\sqrt{5}}{2}, \quad \csc\theta = -\frac{3}{\sqrt{5}}$

**4.** $\frac{12}{5}$

**5.** *a*) $-\frac{5}{13}$ *b*) $-\frac{5}{12}$ *c*) $\frac{13}{12}$

**6.** *a*) $-\frac{1}{\sqrt{5}}$ *b*) $\frac{\sqrt{5}}{2}$ *c*) $-\frac{1}{2}$ *d*) $\frac{4}{5}$

**7.** $a \approx 7.78, \ A \approx 56.7^\circ, \ B \approx 33.3^\circ$

**8.** 13.8

**9.** 12.7 ft

**10.** 252

**11.** 11.0

**12.** $A \approx 54.0^\circ, \ B \approx 36.0^\circ, \ a \approx 13.7$ ft

**13.** 5

**14.** dist: 29.7 mi bearing: S $45.6^\circ$ E

**15.** $78.8^\circ$

**16.** ≈ 38.9 mi

**17.** *a*) $\sqrt{13}$ *b*) $\sqrt{29}$ *c*) $48.0^\circ$

**18.** *a*) $1 + \cot x$ *b*) $\sec^2 x$ *c*) $\sec\alpha \ \csc\alpha$ *d*) $-2\tan^2\alpha$

**19.** $5\cos\theta$