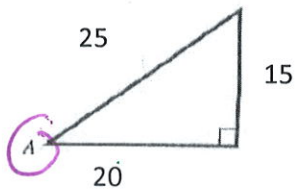


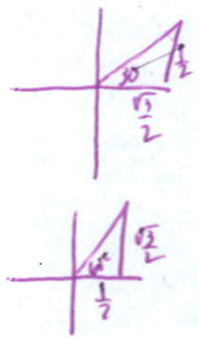
No Calculator! 1-12

1. Find the exact values for  $\sin A$ ,  $\cos A$ , and  $\tan A$  in the figure.



$\frac{15}{25}$   $\sin A = \frac{3}{5}$   
 $\frac{20}{25}$   $\cos A = \frac{4}{5}$   
 $\frac{3}{4}$   $\tan A = \frac{3}{4}$

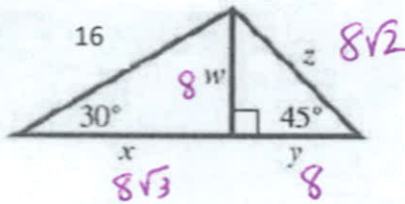
2. Find exact values of the trigonometric functions to complete the table.



| $\theta$   | $\sin \theta$        | $\cos \theta$        | $\tan \theta$        | $\cot \theta$        | $\sec \theta$         | $\csc \theta$         |
|------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|
| $30^\circ$ | $\frac{1}{2}$        | $\frac{\sqrt{3}}{2}$ | $\frac{\sqrt{3}}{3}$ | $\sqrt{3}$           | $\frac{2\sqrt{3}}{3}$ | 2                     |
| $45^\circ$ | $\frac{\sqrt{2}}{2}$ | $\frac{\sqrt{2}}{2}$ | 1                    | 1                    | $\sqrt{2}$            | $\sqrt{2}$            |
| $60^\circ$ | $\frac{\sqrt{3}}{2}$ | $\frac{1}{2}$        | $\sqrt{3}$           | $\frac{\sqrt{3}}{3}$ | 2                     | $\frac{2\sqrt{3}}{3}$ |

Find the exact variable for each variable.

$\frac{1}{2} \times \frac{\sqrt{3}}{2} \times 1$   
 $x = 16$   
 $16(\frac{1}{2}) = 8$   
 $16(\frac{\sqrt{3}}{2}) = 8\sqrt{3}$



$\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{2}}{2} = 1$   
 $x \cdot \frac{\sqrt{2}}{2} = 8$   
 $x = \frac{8 \cdot 2}{\sqrt{2}} = \frac{16}{\sqrt{2}}$

3)  $w = 8$        $x = 8\sqrt{3}$   
 4)  $y = 8$        $z = 8\sqrt{2}$

Find exact values of the six trigonometric functions for each angle. Rationalize denominators when applicable.

5.  $150^\circ$

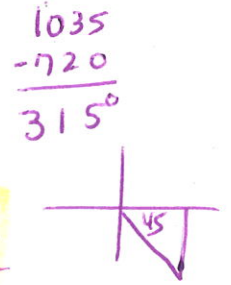
$\sin x = \frac{1}{2}$      $\csc x = 2$   
 $\cos x = -\frac{\sqrt{3}}{2}$      $\sec x = -\frac{2\sqrt{3}}{3}$   
 $\tan x = -\frac{\sqrt{3}}{3}$      $\cot x = -\sqrt{3}$

6.  $-120^\circ$

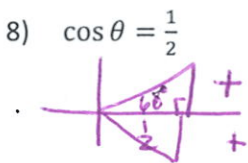
$\sin x = -\frac{\sqrt{3}}{2}$      $\csc x = -\frac{2\sqrt{3}}{3}$   
 $\cos x = -\frac{1}{2}$      $\sec x = -2$   
 $\tan x = \sqrt{3}$      $\cot x = \frac{\sqrt{3}}{3}$

7.  $1035^\circ$

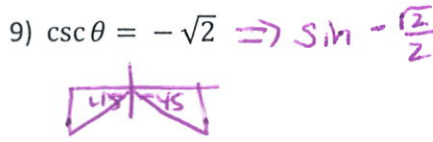
$\sin x = -\frac{\sqrt{2}}{2}$      $\csc x = -\sqrt{2}$   
 $\cos x = \frac{\sqrt{2}}{2}$      $\sec x = \sqrt{2}$   
 $\tan x = -1$      $\cot x = -1$



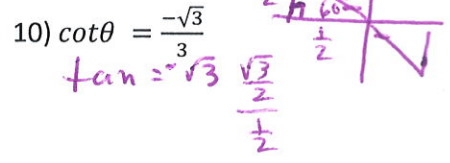
Find all exact values of  $\theta$  in the interval  $[0^\circ, 360^\circ)$  that have the given function value.



8)  $60^\circ, 300^\circ$



9)  $225^\circ, 315^\circ$



10)  $120^\circ, 300^\circ$



Determine whether the statement is true or false. Show all work. If false, tell why.

11)  $\cos(120^\circ + 60^\circ) = \cos 120^\circ \cos 60^\circ - \sin 120^\circ \sin 60^\circ$   
 $\cos(180^\circ) = -\frac{1}{2}(\frac{1}{2}) - \frac{\sqrt{3}}{2}(\frac{\sqrt{3}}{2})$   
 $-1 = -\frac{1}{4} - \frac{3}{4}$   
 $-1 = -1$

11) True

12)  $\sin 30^\circ + \sin 60^\circ = \sin(30^\circ + 60^\circ)$   
 $\frac{1}{2} + \frac{\sqrt{3}}{2} = \sin(90^\circ)$   
 $\frac{1+\sqrt{3}}{2} = 1$

12)  $\frac{1}{2} + \frac{\sqrt{3}}{2} \neq 1$  False

Use a calculator to approximate each value.

13.  $\sin 35^\circ 14'$

13) 0.5769076142

14.  $\csc(-148^\circ 25')$

14) -1.909351161

Use a calculator to find the value of  $\theta$ , to the nearest tenth, in the interval  $[0^\circ, 90^\circ]$  that satisfies each statement.

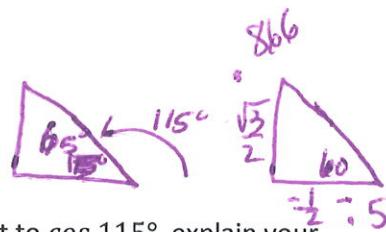
15.  $\tan \theta = 1.569685577$

15)  $57.5^\circ$

16.  $\csc \theta = 1.471797481$

16)  $42.8^\circ$

If  $\frac{\sqrt{2}}{2} \approx 0.707$  and  $\frac{\sqrt{3}}{2} \approx 0.866$



17) Without using a calculator, determine which of the following numbers is closest to  $\cos 115^\circ$ , explain your answer using complete sentences. a) 0.4 b) 0.6 c) 0 d) -0.4 e) -0.6

For  $\cos \theta$ , when angle gets bigger the  $\cos \theta$  gets smaller  
 so if  $\cos 60^\circ = 0.5$ , then  $\cos 65^\circ$  should be slightly smaller  
-0.4.

18) Without using a calculator, determine which of the following numbers is closest to  $\sin 115^\circ$ , explain your answer using complete sentences. a) 0.9 b) 0.1 c) 0 d) -0.9 e) -0.1

For  $\sin \theta$ , when  $\theta$  gets larger the  $\sin$  gets larger  
 so if  $\sin 60^\circ \approx 0.866$ , then  $\sin 65^\circ \approx 0.9$  slightly larger.  
A

19) For what angles  $\theta$  between  $0^\circ$  and  $360^\circ$  does  $\cos \theta = -\sin \theta$ ?

are opposite in 2<sup>nd</sup> & 4<sup>th</sup> quadrants  $135^\circ, 315^\circ$

20) For what angles  $\theta$  between  $0^\circ$  and  $360^\circ$  does  $\cos \theta = \sin \theta$ ?

are equal in 1<sup>st</sup> and 3<sup>rd</sup> quadrant  $45^\circ, 225^\circ$