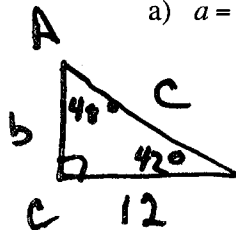


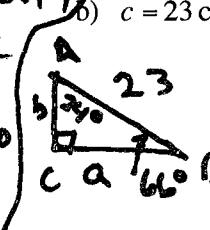
1. Draw a picture to represent the right triangle, then find the missing values. Round to two decimal places.

a)  $a = 12$  in.,  $B = 42^\circ$   $A = 48^\circ$   $b = 10.8$   $c = 16.14$



$\tan 42^\circ = \frac{b}{12}$   
 $12 \cdot \tan 42^\circ = b$   
 $b = 10.8$

b)  $c = 23$  cm.,  $A = 24^\circ$   $B = 66^\circ$   $a = 9.35$   $b = 21.01$



$\sin 24^\circ = \frac{a}{23}$   
 $23 \cdot \sin 24^\circ = a$   
 $a = 9.35$

$\cos 24^\circ = \frac{b}{23}$   
 $b = 23 \cdot \cos 24^\circ$   
 $b = 21.01$

2. Convert the following degrees to radians and the radians to degrees.

a)  $72^\circ$   
 $\frac{72^\circ}{1} \cdot \frac{\pi}{180^\circ} = \frac{2\pi}{5}$

b)  $\frac{4\pi}{5}$   
 $\frac{4\pi}{5} \cdot \frac{180^\circ}{\pi} = 144^\circ$


c)  $105^\circ$   
 $105^\circ \cdot \frac{\pi}{180^\circ} = \frac{7\pi}{12}$

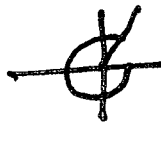
d)  $\frac{8\pi}{9}$   
 $\frac{8\pi}{9} \cdot \frac{180^\circ}{\pi} = 160^\circ$


e)  $-435^\circ$   
 $-435^\circ \cdot \frac{\pi}{180^\circ} = -\frac{29\pi}{12}$


f)  $-\frac{34\pi}{15}$   
 $-\frac{34\pi}{15} \cdot \frac{180^\circ}{\pi} = -408^\circ$

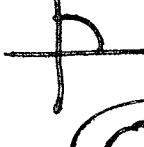
3. Draw the following angles, find the reference angles, and find the value without the use of a table or calculator.


a)  $\cos(210^\circ)$   $RA\ 30^\circ$   
  $-\frac{\sqrt{3}}{2}$

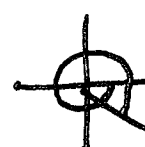
b)  $\sin(-300^\circ)$   $RA\ 60^\circ$   
  $\frac{\sqrt{3}}{2}$


c)  $\tan(-45^\circ)$   $RA\ 45^\circ$   
  $-1$

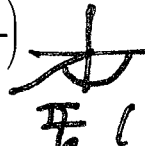
d)  $\csc(240^\circ)$   $RA\ 60^\circ$   $\sin 60^\circ = \frac{\sqrt{3}}{2}$   
  $\frac{2\sqrt{3}}{\frac{\sqrt{3}}{2}} = -\frac{2\sqrt{3}}{3}$

e)  $\cot\left(\frac{\pi}{2}\right)$   $(0, 1)$   $r = 1$   
  $0$

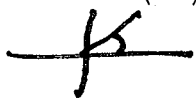
f)  $\sin\left(\frac{13\pi}{4}\right)$   $3\frac{1}{4}\pi$   $RA\ \frac{\pi}{4}$   $(45^\circ)$   
  $-\frac{\sqrt{2}}{2}$

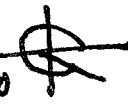
g)  $\sec\left(-\frac{7\pi}{3}\right)$   $2\frac{1}{3}\pi$   $RA\ \frac{\pi}{3}$   $(60^\circ)$   
  $\cos \frac{\pi}{3} = \frac{1}{2}$   $2$

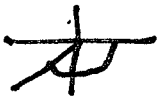
h)  $\cos\left(\frac{17\pi}{6}\right)$   $2\frac{5}{6}$   $RA\ \frac{\pi}{6}$   $(30^\circ)$   
  $-\frac{\sqrt{3}}{2}$


i)  $\csc\left(-\frac{5\pi}{6}\right)$   $RA\ \frac{\pi}{6}$   $(30^\circ)$   
  $\sin \frac{\pi}{6} = \frac{1}{2}$   $-2$

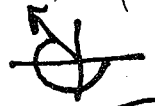
4. Draw the following angles, find the reference angles, then find the value with the use of a table (no calculator)


a)  $\tan(83^\circ)$  RA  $83^\circ$   
  
 8.1443

b)  $\cos(341^\circ)$   
  
 RA  $19^\circ$   
 .9455

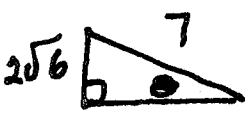
c)  $\csc(-123^\circ)$   
  
 RA  $57^\circ$   
 -1.1924

d)  $\sin(562^\circ)$   
  
 RA  $22^\circ$   
 -.3746

e)  $\cot(-259^\circ)$   
  
 RA  $79^\circ$   
 -.1944

f)  $\sec(-451^\circ)$   
  
 RA  $89^\circ$   
 -57.2987

5. The  $\cos\theta = \frac{5}{7}$ , find the values of the 5 other trig functions.



$x^2 = 24$   
 $x = \sqrt{24}$

$x = \sqrt{24}$

$x = 2\sqrt{6}$

$x^2 + 5^2 = 7^2$   
 $x^2 + 25 = 49$

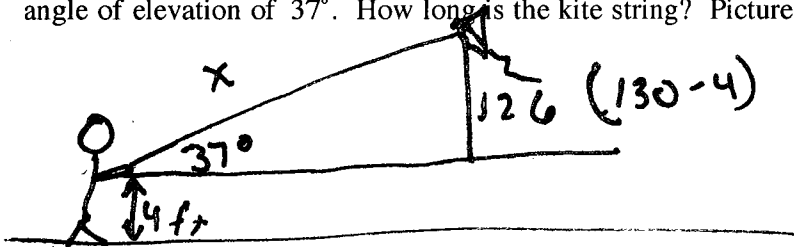
$\sin\theta = \frac{2\sqrt{6}}{7}$

$\csc\theta = \frac{7\sqrt{6}}{2\sqrt{6}\sqrt{6}} = \frac{7\sqrt{6}}{12}$

$\tan\theta = \frac{2\sqrt{6}}{5}$

$\sec\theta = \frac{7}{5}$   
 $\cot\theta = \frac{5\sqrt{6}}{2\sqrt{6}\sqrt{6}} = \frac{5\sqrt{6}}{12}$

6. Suzy is flying a kite that is 130 ft. off the ground. She is holding the string 4 ft above the ground with an angle of elevation of  $37^\circ$ . How long is the kite string? Picture?



$\sin 37^\circ = \frac{126}{x}$

$x = \frac{126}{\sin 37^\circ}$

$x \approx 209.4 \text{ ft}$

7. Suzy's back window wiper arm is 2 ft long, only the outer most 13 in is actually blade. If the blade arm rotates through  $120^\circ$ , what is the area of the back window that gets cleaned? Picture?



$120^\circ = \frac{2\pi}{3}$

$A = \frac{1}{2}r^2\theta$

Total area =  $\frac{1}{2}(24)^2(\frac{2\pi}{3}) = 192\pi \text{ in}^2$

NOT cleaned =  $\frac{1}{2}(11)^2(\frac{2\pi}{3}) = \frac{121}{3}(40.3)\pi \text{ in}^2$

$192\pi - \frac{121}{3}\pi = \frac{455\pi}{3} (151.67)$

8. Find the following without a calculator in both radians and degrees.

a)  $\sin^{-1}(\frac{1}{2})$   
 $30^\circ, \frac{\pi}{6}$

b)  $\cos^{-1}(-\frac{\sqrt{2}}{2})$   
 $135^\circ, \frac{3\pi}{4}$

c)  $\arctan(-1)$   
 $-45^\circ, \frac{\pi}{4}$

d)  $\text{arc sec}(2)$   
 $60^\circ, \frac{\pi}{3}$

9. Find the following with a calculator in both radians and degrees.

a)  $\tan^{-1}(.9476)$   
 $43.46^\circ, .758$

b)  $\arcsin(-\frac{5}{12})$   
 $-24.62^\circ, -.430$

c)  $\cot^{-1}(\frac{8}{5})$   
 $32^\circ, .5586$

d)  $\arccos(-.8324)$   
 $146.35^\circ, 2.55$