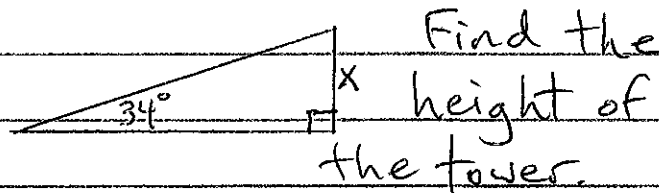


(5) ① Convert 34.9723° to degrees, minutes, seconds.
Show all work.



(10) ② a) Convert 4.28 radians to degrees.
b) Find the length of the intercepted arc in a circle of radius 4, if the central angle is 17° .

(10) ⑦ If $\sin \theta = -\frac{3}{8}$, θ in QIV, find the exact values of the other 5 trig. functions.

(10) ③ a) Simplify without a calculator:

(5) ⑧ Find the exact value (radical form) of $\sec\left(\frac{5\pi}{4}\right)$.

$$1 - \cos^2 35^\circ - \cos^2 55^\circ$$

(5) ⑨ Where is $\csc x$ not defined on $0 \leq x \leq 4\pi$?

Show all steps.

b) Use identities to find $\cot \theta$ if $\cos \theta = \frac{2}{3}$, θ is acute.

Do not use a triangle.

(10) ④ a) Find $\sec 5.31$ on the calculator.

b) Find the exact value of $2 \tan 60^\circ - \sec 30^\circ$.

(5) ⑤ If $a = 3$, $B = 15^\circ$, find A, b, c . ($C = 90^\circ$)

(5) ⑥ A wire is attached to the top of a tower. The wire makes an angle of 34° with the ground.

Wire is 80 ft long. (next column)

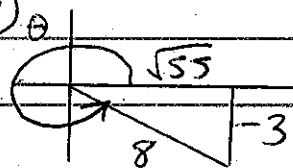
MAC 1114 EXAM I KEY (MWF, F'11)

① $(.9723)(60) = 58.338'$
 $(.338')(60) = 20.28''$
 $34^\circ 58' 20''$

⑥ $\sin 34^\circ = \frac{x}{80}$
 $80 \sin 34^\circ = x$
 $x \approx 44.7 \text{ ft}$

② a) $4.28 \left(\frac{180^\circ}{\pi} \right) \approx 245.226^\circ$

⑦ $x^2 + (-3)^2 = 8^2$
 $x^2 = 64 - 9$
 $x^2 = 55$



(not to scale) $x = \sqrt{55}$

b) $S = r\theta = 4(17) \left(\frac{\pi}{180^\circ} \right)$
 ≈ 1.1868

$\csc \theta = -\frac{8}{3}$

$\cos \theta = \sqrt{55}/8$ $\sec \theta = \frac{8}{\sqrt{55}}$

$\tan \theta = -3/\sqrt{55}$ $\cot \theta = -\frac{\sqrt{55}}{3}$

③ a) $1 - \cos^2 35^\circ - \sin^2 35^\circ$
 $= 1 - (\cos^2 35^\circ + \sin^2 35^\circ)$
 $= 1 - 1 = 0$

⑧ $\sec \frac{5\pi}{4} = -\sec \frac{\pi}{4} = -\sqrt{2}$

Since $\frac{5\pi}{4}$ is in QIII

b) $\sin \theta = \sqrt{1 - \cos^2 \theta}$
 $= \sqrt{1 - \left(\frac{2}{3}\right)^2} = \sqrt{1 - \frac{4}{9}}$
 $= \sqrt{\frac{5}{9}} = \frac{\sqrt{5}}{3}$

$\cot \theta = \frac{\cos \theta}{\sin \theta} = \frac{2/3}{\sqrt{5}/3}$
 $= \frac{2}{\sqrt{5}}$

⑨ Using $(-1, 0)$ and $(1, 0)$
 on unit circle:

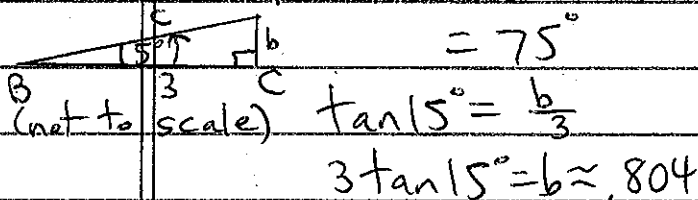
$0, \pi, 2\pi, 3\pi, 4\pi$

④ a) $\sec 5.31 = \frac{1}{\cos 5.31}$
 ≈ 1.77724

(Use radian mode)

b) $2\sqrt{3} - \frac{2}{\sqrt{3}} = \frac{4}{\sqrt{3}}$

⑤ $A = 90^\circ - 15^\circ$
 $= 75^\circ$



$\tan 15^\circ = \frac{b}{3}$
 $3 \tan 15^\circ = b \approx .804$

$\cos 15^\circ = \frac{3}{c}$

$c = \frac{3}{\cos 15^\circ} \approx 3.1058$