

MAC 1114

(MWF 60 pts)

EXAM I

MR. NADEL

SPRING 2017

(5) ① Convert 29.4581° to degrees, minutes, seconds.
Show all work.

(10) ② a) Convert 4.2 radians to degrees.

b) Find the length of the intercepted arc if the radius of a circle is 4 inches, and the central angle is 35° .

(10) ③ a) Simplify without a calculator. Show all steps.

$$1 - \cos^2 25^\circ - \cos^2 65^\circ$$

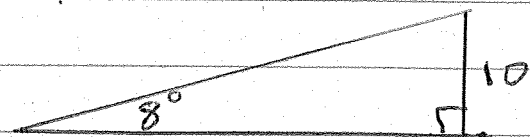
b) Use an identity to find the exact value of $\cot\left(\frac{\pi}{2} - \theta\right)$ if $\tan \theta = 5$.

(10) ④ a) Find $\cot(2.77)$ on the calculator.

b) Find the exact value of $3 \sin 45^\circ - 2 \cos 30^\circ$.

(5) ⑤ If $a=4$, $c=7$, find b and B in right triangle ABC ($C=90^\circ$)

(5) ⑥ If a plane climbs at a constant angle of 8° to the horizontal and reaches a height of 10 miles, how far has the plane gone in the air?



(not to scale)

(10) ⑦ If $\cos \theta = -\frac{2}{3}$, θ in $QIII$, find the exact values of the other 5 trig. functions

(5) ⑧ Find the exact value (radical form) of $\tan\left(\frac{2\pi}{3}\right)$.

MAC 1114 EXAM I KEY (SP'17)

① $(64581)(60) = 27.486'$

$(6486)(60) = 29$

$\text{Get } 29^\circ 27' 29''$

② a) $(4.2)\left(\frac{180^\circ}{\pi}\right) \approx 240.64^\circ$

b) $s = r\theta = 4(35^\circ)\left(\frac{\pi}{180^\circ}\right) = 2.44$

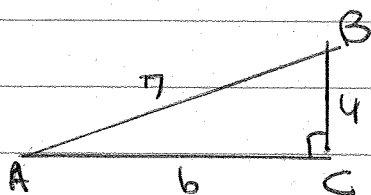
③ a) $1 - \cos^2 25^\circ - \cos^2 65^\circ$
 $= 1 - \cos^2 25^\circ - \sin^2 25^\circ$
 $= 1 - (\cos^2 25^\circ + \sin^2 25^\circ)$
 $= 1 - 1 = 0$

b) $\cot\left(\frac{\pi}{2} - \theta\right) = \tan\theta = 5$

④ a) -2.566

b) $3\left(\frac{\sqrt{2}}{2}\right) - 2\left(\frac{\sqrt{3}}{2}\right) = \frac{3\sqrt{2} - 2\sqrt{3}}{2}$

⑤



$16 + b^2 = 49$

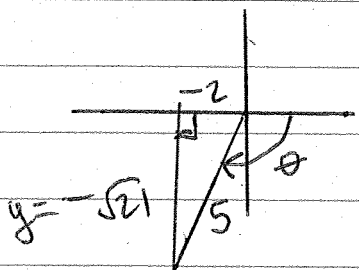
$b = \sqrt{33}$

$\cos B = \frac{4}{7} \Rightarrow B = 55.2^\circ$

⑥

$\sin 8^\circ = \frac{10}{c} \Rightarrow c = 71.9 \text{ miles}$

⑦



$z^2 + y^2 = 5^2$

$y^2 = 21$

$y = -\sqrt{21}$

$\sec\theta = -\frac{5}{2}$

$\cot\theta = \frac{2}{\sqrt{21}}$

$\tan\theta = \frac{\sqrt{21}}{2}$

$\sin\theta = -\frac{\sqrt{21}}{5}$

$\csc\theta = -\frac{5}{\sqrt{21}}$

⑧ $-\sqrt{3}$