

Math IV – Second Semester Final Exam REVIEW

Name: _____

Period: _____

****All work should be clearly organized and labeled on a SEPARATE SHEET for credit.****

UNIT 5

1.) Find the exact values of the following without a calculator:

- a. $\sin 0^\circ$
- b. $\sin 1485^\circ$
- c. $\sec 1860^\circ$
- d. $\cos\left(-\frac{\pi}{4}\right)$
- e. $\tan \frac{11\pi}{6}$
- f. $\cot \frac{-5\pi}{3}$

2.) $y = \frac{1}{11} \sin \theta$.

- a. Find the amplitude.
- b. **Graph** the function.

3.) Write an equation of the cosine function with amplitude 3 and period 6π .

4.) Write an equation of the cosine function with the given amplitude, period, phase shift, and vertical shift.

$$\text{amplitude} = 3; \quad \text{period} = \pi; \quad \text{phase shift} = \frac{3}{8}\pi; \quad \text{vertical shift} = -3$$

5.) The normal monthly temperatures ($^\circ\text{F}$) for Omaha, Nebraska, are recorded below.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
t	1	2	3	4	5	6	7	8	9	10	11	12
Temp.	21°	27°	39°	52°	62°	72°	77°	74°	65°	53°	39°	25°

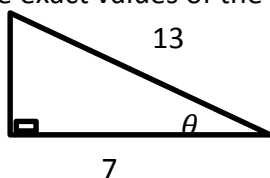
- a. Write a sinusoidal function that models Omaha's monthly temperature variation.
 - b. Use the model to estimate the normal temperature during the month of June.
- 6.) Write an equation, $g(t)$, which transforms $f(t) = \csc t$ compressed vertically by a factor of $\frac{1}{2}$ and shifted 8 units to the left and down 6 units.

UNIT 6

- 7.) Simplify $\csc x - \tan x \cos x$
- 8.) $\cot x \sin x = \cos x$
- What basic trigonometric identity would you use to verify the above statement?
 - Verify the above.
- 9.) $\csc\left(\frac{\pi}{2} - \theta\right) = \sec \theta$
- Which sum or difference identity can be used to verify the above identity?
 - Verify the identity.
- 10.) Verify:
- $\cot x - \csc x = \frac{\cos x - 1}{\sin x}$
 - $\sin(\pi + x) = -\sin x$
- 11.) Solve:
- $4 - 6 \sin x = 4 - \sin x$ for $0^\circ \leq x \leq 180^\circ$
 - $\tan x + 1 = \sec x$ for $[0, 360)$
 - $\tan^2 x + 5 = 4 \sec x$ on the interval $[0, 2\pi)$
 - $2 \cos x \sin x - \cos x = 0$ for $0 \leq x \leq 2\pi$
- 12.) Use a calculator to solve the following on the interval $[0, 360^\circ]$. Keep two decimals.
- $$16 - 16\cos^2 x = 1$$

UNIT 7

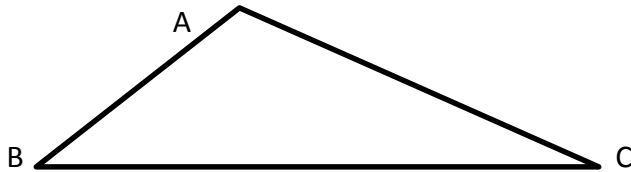
- 13.) At a certain time of day, the Washington Monument casts a shadow 790 feet long. From the tip of the shadow, the angle from the horizontal to the top of the monument is 35° . Use this information to find the height of the monument to the nearest foot.
- 14.) Find the exact values of the six trigonometric functions of θ for the right triangle shown below:



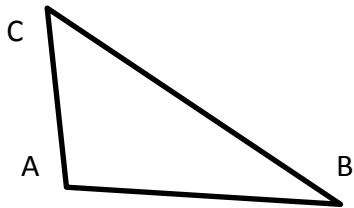
- 15.) In what quadrant does the terminal side of θ lie if $\tan \theta < 0$ and $\cos \theta > 0$?

16.) Given a triangle with $a = 14$, $A = 41^\circ$, and $B = 34^\circ$, what is the length of c ? Round to the nearest tenth.

- 17.) $\triangle ABC$ below has $c = 7$, $B = 45^\circ$, and $C = 55^\circ$
- Solve for all missing angle measures and side lengths.
 - Find the Area of $\triangle ABC$



- 18.) $\triangle ABC$ below has $a = 11$, $b = 5$, and $C = 20^\circ$
- Solve for all missing angle measures and side lengths.
 - Find the Area of $\triangle ABC$



19.) A painter needs to cover a triangular region 60 meters by 69 meters by 71 meters. A can of paint covers 70 square meters. How many cans will be needed?