**Precalculus Final Exam 2019 Review #2 Questions** Name _____

*Complete the following problems on a separate sheet of paper*

1. Give the **general** solution of the equation $4\sin^2 x - 3 = 0$.

2. Find all solutions of the equation $\tan^3 x = \tan x$ in the interval $[0, 2\pi)$.

3. Find the exact value of sin (-15°) using the fact that –15° = 45°–60°

4. Simplify and give the exact value: $\dfrac{\tan 325° - \tan 25°}{1 + \tan 325° \tan 25°}$

5. Given a triangle with $A$ = 61°, $B$ = 49°, and c = 5396, find $a$, $b$, and $C$.

6. Given a triangle with A = 71°, $b$ = 10, and $c$ = 19, find the area to the nearest tenth square unit.

7. Given a triangle with a =135, b = 71.6, and c = 69, find $B$.

8. Determine the number of solutions to each of the following triangles having the given side(s)/angle(s) – be prepared to explain your conclusion:

   a) $C$=58°, $a$=67, and $c$=50 b) $A$=107°, b=17, and $a$=25 c) $B$ = 27°, b = 28, and $a$= 78

9. Write the complex number in trigonometric form: a) $\sqrt{2} - i\sqrt{2}$ b) 17+32$i$

10. Multiply [12(cos33°+$i$ sin 33°)]•[8(cos 27° + $i$ sin 27°)] and give your answer in trig. and standard forms.

11. Given that $z_1 = 4 - 3i$ and $z_2 = -2 + i$, find a) $z_1 - z_2$ b) $z_1 \cdot z_2$ c) $\dfrac{z_1}{z_2}$

12. Use trigonometric identities to simplify $\dfrac{1}{\csc\alpha + 1} - \dfrac{1}{\csc\alpha - 1}$.

13. Verify $\sec^2 x \cot x - \cot x = \tan x$

14. Give the general solution of the equation $4\cos\theta = 1 + 2\cos\theta$.

15. Find all solutions of the equation $\sec^2 x + 6\tan x + 4 = 0$ in the interval $[0, 2\pi)$.

16. Find the exact value of $\sin\left(\dfrac{19\pi}{12}\right)$ using the fact that $\dfrac{19\pi}{12} = \dfrac{11\pi}{6} - \dfrac{\pi}{4}$

17. Write the expression as sine, cosine, or tangent of an angle $\cos 45^0 \cos 120^0 - \sin 45^0 \sin 120^0$

18. Verify the identity: $\dfrac{\sin(\alpha+\beta)}{\cos\alpha \cdot \cos\beta} = \tan\alpha + \tan\beta$

19. Find the exact values of sin2*u*, cos2*u*, and tan2*u* given $\cos u = -\dfrac{2}{\sqrt{5}}, \quad \dfrac{\pi}{2} < u < \pi$

20. Find the exact values of sin(*u*/2), cos(*u*/2), and tan(*u*/2) given $\sec u = -6, \qquad \dfrac{\pi}{2} < u < \pi$

21. Solve the triangle given $A = 16°$, $B = 98°$, and c = 8.4

22. Solve the triangle given $a = 16.4$, $b = 8.8$, and c = 12.2

23. Solve the triangle given $B = 25°$, $a = 6.2$, and $b = 4$

24. The lengths of the diagonals of a parallelogram are 30 meters and 40 meters. Find the lengths of the sides of the parallelogram if the diagonals intersect at an angle of 34°.

25. Two planes leave the Newark airport at approximately the same time. One is flying S 5°W at 420 mph and the other is flying N 80° E at 520 mph. Determine the distance between the planes after they have flown for 3 hours.

26. Given a triangle with A = 11°, $b = 22$, and $c = 21$, find the area to the nearest tenth square unit.

27. Plot the complex number $5 + 12i$ and find its absolute value, then write the complex number in trigonometric form.

28. Find the product and quotient of the following after writing both in trigonometric form

$$z_1 = 2\sqrt{3} - 2i, \qquad z_2 = -10i$$