<u>Instructions</u>

- **Complete the problems as if this were an actual test.**
  - **70-80 minutes of _uninterrupted_ time**. (this means no phones, Netflix, snapchat, etc….I promise you will survive☺)
  - **Don't use your calculator on the NonCalc problems**
  - **No help from notes, friends, google, etc.**

- **After you have completed the problems, grade your test using the key provided.**

- **Try extra problems, similar to the ones you missed, until you feel like you understand those concepts.**

Simplify the following. Make sure to show all work.
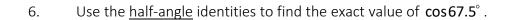
1. $\tan\theta\cot\theta - \cos^2\theta$

2. $\cos\theta\sec\theta - \dfrac{\cos\theta}{\sec\theta}$

3.   Find the <u>exact value</u> of $\cos 75°$ using a <u>sum or difference</u> identity.

4.   Find the exact value of $\sin(u+v)$ given than $\sin u = -\dfrac{15}{17}$ and $\cos v = \dfrac{5}{13}$.

        Both u and v are in Quadrant IV.

5.   Use a <u>double-angle</u> formula to find the exact value of $\sin 2u$ when $\cos u = -\dfrac{12}{13}$, where $\pi < u < \dfrac{3\pi}{2}$.

6.   Use the <u>half-angle</u> identities to find the exact value of $\cos 67.5°$.

Solve the following equations for <u>all values</u> of x.

7. $2\sqrt{2} = -4\cos\theta$ 8. $2\cot\theta + \cot^2\theta = -1$

Solve the following equations in the interval $[0, 2\pi)$.

9. $2\sin 3\theta + 1 = 0$ 10. $\cos^2\theta + 2 = -3\cos\theta + \sin^2\theta$

Verify the following identities.

11. $\tan^2 \alpha \sec^2 \alpha + \sec^2 \alpha = \sec^4 \alpha$

12. $\dfrac{\sec\theta \sin\theta}{\tan\theta + \cot\theta} = \sin^2 \theta$