# Instructions

- Complete the problems as if this were an actual test.
  - 50-60 minutes of uninterrupted time. (this means no phones, Netflix, snapchat, etc….I promise you will survive 😊)
  - 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.

**Secondary Math III**
**Practice Exam**

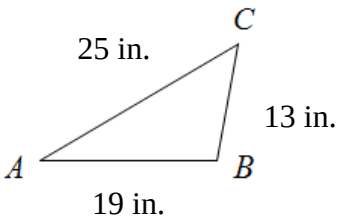
Name: _____

Period: _____

**1 pt. each.**

1. Use the *Law of Sines* to find side *b* in triangle ABC, given $A = 15^\circ, B = 60^\circ, a = 4.5$

2. Find the area of the following triangle:

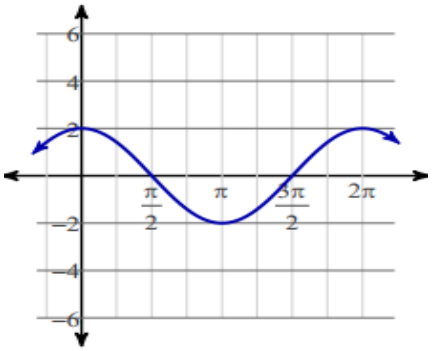



3. Use the *Law of Cosines* to find side *c* in triangle ABC, given: $C = 107^\circ, a = 9, b = 6$

4. Find all solutions of the equation: $\sin^2 x - \sin x = 0$ in the interval $0 \le x < 2\pi$

5. Which of the following functions has an amplitude of 3 and a period of $6\pi$?
   a. $f(x) = -3\sin(\frac{1}{3}x)$
   b. $f(x) = \frac{1}{2}\sin(2x)$
   c. $f(x) = 2\sin x$
   d. $f(x) = -\frac{1}{3}\sin(\frac{1}{3}x)$

6. Write the function that best describes the following graph:




**Free Response. Show all work.**

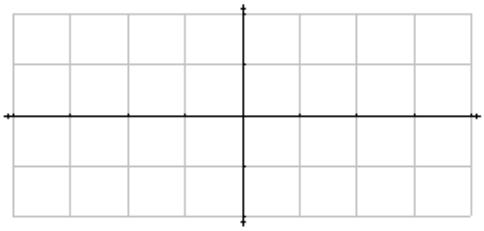
7. Graph two periods for the following function. State if there are any reflections. Find the amplitude and the period. Include scales on both axes. (4 pts.)

$$f(x) = 3\cos 4x$$

Reflection? Yes No

Amplitude: _____

Period: _____



8. Write an equation for the transformed function $g(x)$ if the graph of $f(x) = \cos x$ is reflected on the *x*-axis, shifted to the left $\pi/2$, and down 3. (3 pts.)

$g(x) =$ _____

10. Find all solutions of the following equations in the interval $0 \leq x < 2\pi$

a. $\cos x = \frac{\sqrt{3}}{2}$ (3 pts.)

b. $2 \sin x \cos x + \cos x = 0$ (6 pts.)

11. Find all solutions of the following equations in the interval $0 \leq x < 360^{\circ}$

a. $\sqrt{3} \csc x + 2 = 0$ (4 pts.)

b. $2 \sin^2 x = 1$ (4 pts.)

12. Use a graphing calculator to find approximate solutions in the interval [0°, 180°]. Show graph. (3 pts.)

$$2 \sin^2 x = 1 + \sin(2x)$$

$x \approx$ _____

13. Use the Law of Sines and/or Law of Cosines to solve triangle ABC. Identify given situation. Draw and label the triangle first. Round angle measures to the nearest degree and sides to the nearest tenth. If there are two triangles, find both. List all angles and sides in given spaces provided. (5 pts. each)

a. $B = 48^{\circ},\ C = 102^{\circ},\ b = 7.8$

b. $A = 34^{\circ},\ a = 124,\ b = 99$

Angle A = _____

Side a = _____

Side c = _____

Angle B = _____

Angle C = _____

Side c = _____

c. $a$ = 11 in, $b$ = 13 in, $c$ = 18 in

Angle A = _____

Angle B = _____

Angle C = _____

14. Given ΔABC with $b$ = 14 cm, $c$ = 20 cm and C = 50°, find the area. Round to the nearest whole number. (3 pts.)

Area = _____

15. Two airplanes leave City A, one heading straight for City C. and the other straight for City B. The angle formed is 5 degrees. The distance from City A to City C. 2058 km, and the distance from City A to City B is 2015 km. Use the Law of Cosines to estimate the distance from City C to City B. Round to the nearest tenth of a kilometer. (3 pts.)