

Name: \_\_\_\_\_ Original Score: \_\_\_\_\_ / 32 marks → \_\_\_\_\_ % → ISM: \_\_\_\_\_ → IB: \_\_\_\_\_  
Date: \_\_\_\_\_ Block: \_\_\_\_\_ After Corrections: \_\_\_\_\_ / 32 marks

## **MATH HONORS 2: UNIT 5 QUIZ 1** – Triangle and Circle Trigonometry

### **SECTION A: Calculator Inactive – 18 minutes**

1. An angle  $\theta$  measures 13 radians. For this angle, is  $\sin \theta > \cos \theta$  or is  $\cos \theta > \sin \theta$ ? Explain how you know. **(2M)**

2. Explain why the values of cosine lie between -1 and 1, but the values for tangent are infinite. **(2M)**

3. An angle  $\theta$  is co-terminal to  $-850^\circ$ . **(2M)**

a. Given that  $0^\circ \leq \theta < 360^\circ$ , find  $\theta$ .

b. Convert  $\theta$  to radians (in terms of  $\pi$ ).

4. Evaluate to find the exact values of: **(2M)**

a.  $\tan(240^\circ)$

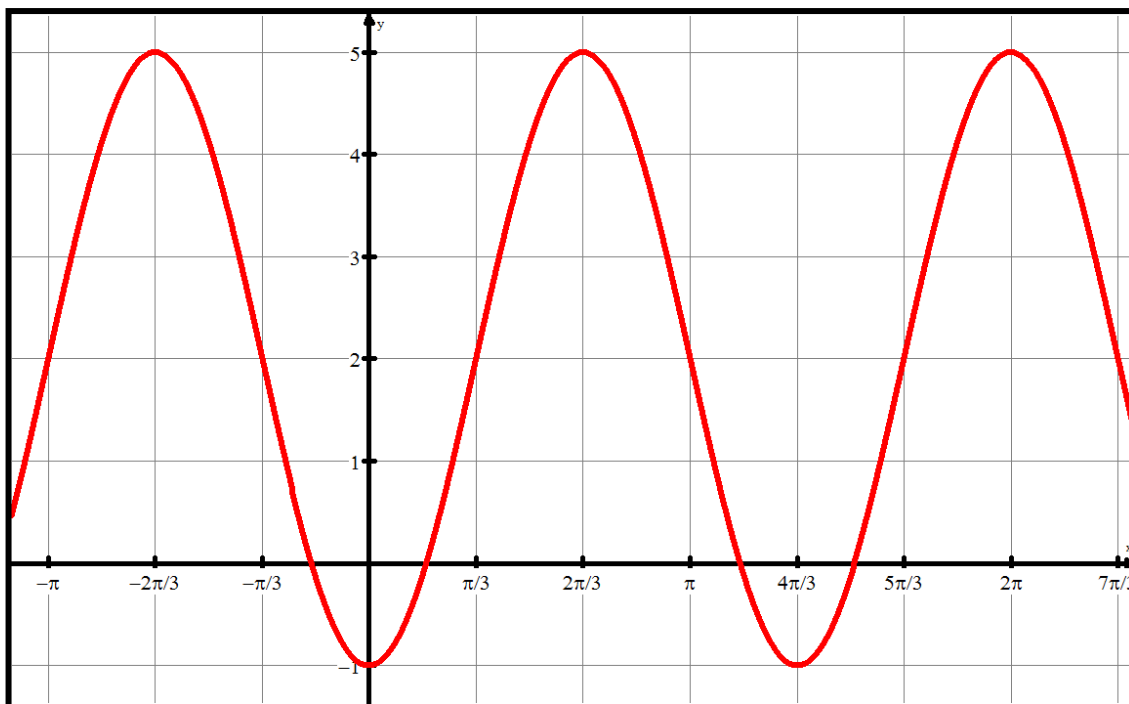
b.  $\csc\left(\frac{7\pi}{4}\right)$

5. Solve  $\cos x = -\frac{1}{2}$  for all solutions of  $x$ , given that  $-2\pi \leq \theta \leq \pi$ . (3M)

6. You are given that  $\cot \theta = -\frac{15}{8}$ . (3M)

- a. Determine the possible values of  $\sec \theta$ .      b. Why is there more than one value of  $\sec \theta$ ?

7. Use the graph of the function  $f(x) = a \cos(kx) + d$  to find the values of  $a$ ,  $k$ , and  $d$ . (3M)



**SECTION B: Calculator Active – 17 minutes**

8. Mr. Santowski and Mr. Atkinson are playing golf at Intramuros. It is Mr. A's turn to hit the ball towards flag F. Mr. S is standing 15 meters behind Mr. A such that Mr. S, Mr. A and flag F are all in one line (i.e. points F, A & S are collinear). Since Mr. S and Mr. A are math teachers, they automatically determine the angle of elevation of Mr. A's ball at the moment that it reaches its maximum height in its flight path. Mr. S determines the angle of elevation of Mr. A's golf ball to be  $12.2^\circ$ , while Mr. A determines his ball's angle of elevation to be  $14^\circ$ .

**(5M)**

a. Show that the height of the ball can be determined by the equation  $h = \frac{15}{\cot 12.2^\circ - \cot 14^\circ}$ .

- b. Hence, or otherwise, determine the maximum height of the ball.

9. Mr. Atkinson and Mr. Santowski are designing a triangular-shaped stage for this year's Battle of the Bands performers. Mr. S proposes that in triangle  $MAT$ , angle  $M$  measures  $21^\circ$ , side  $m$  measures 20 meters, and side  $t$  measures 34 meters.

**(8M)**

- a. Mr. A thinks that an issue may arise in planning to build a stage with the dimensions that Mr. S has proposed. What is this issue, and how do you know if this issue does or doesn't arise?

- b. Mr. S and Mr. A must determine the length of side  $a$  (which faces the audience), because Mr. Toze has told them that the front of the stage must be between 10 meters and 20 meters in length. Find the measure of side  $a$ .

- c. Determine the area of the stage.

## **STUDENT SELF-EVALUATION**

After the time allocated for writing this assessment has passed (or if you have finished early), answer the following questions:

- a. Estimate the letter grade that you achieved on this assessment (e.g. A-, C+, etc.): \_\_\_\_\_
- b. Which concepts did you have the most difficulty with during this assessment and/or this unit?

## **TEACHER COMMENTS**

In every formal assessment this year, 2 marks, 1 mark, or 0 marks will be awarded for the clarity of your communication in the presentation of your solutions and your written explanations.

On this assessment, you were awarded: \_\_\_\_\_ / 2 marks for communication.

Additional comments: