Name: _____ Original Score: _____ / 32 marks

→_____ % → ISM: _____ → IB: _____

Date: _____ Block: ____ After Corrections: _____ / 32 marks

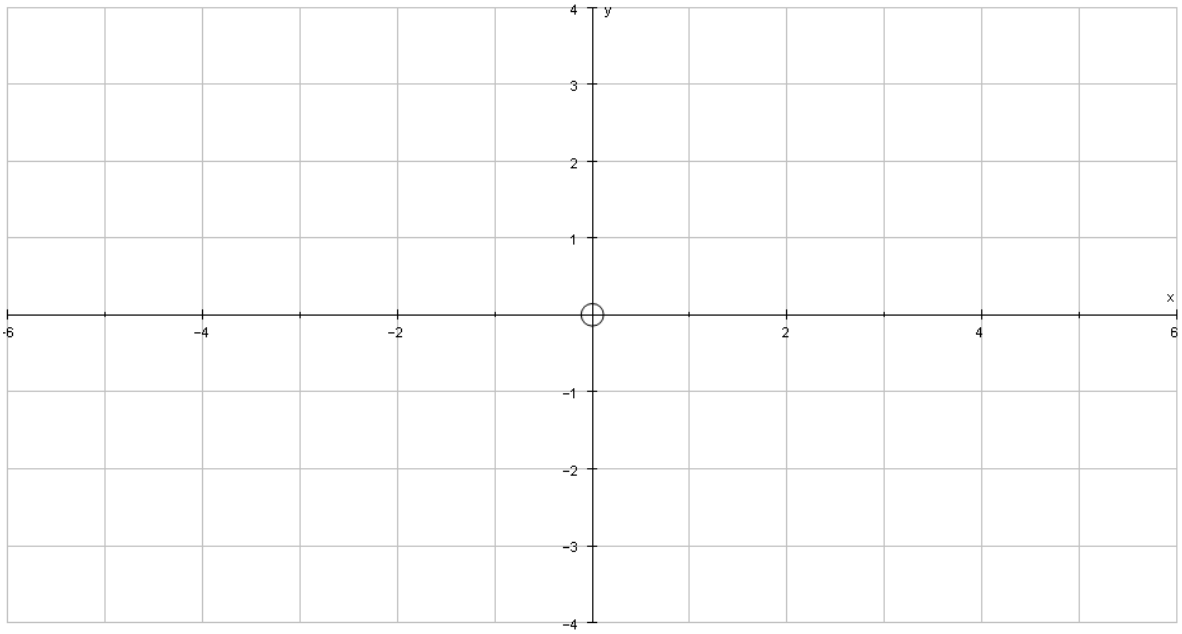
MATH HONORS 2: UNIT 5 QUIZ 2 – Trigonometric Inverses, Identities & Equations

SECTION A: Calculator Inactive – 30 minutes

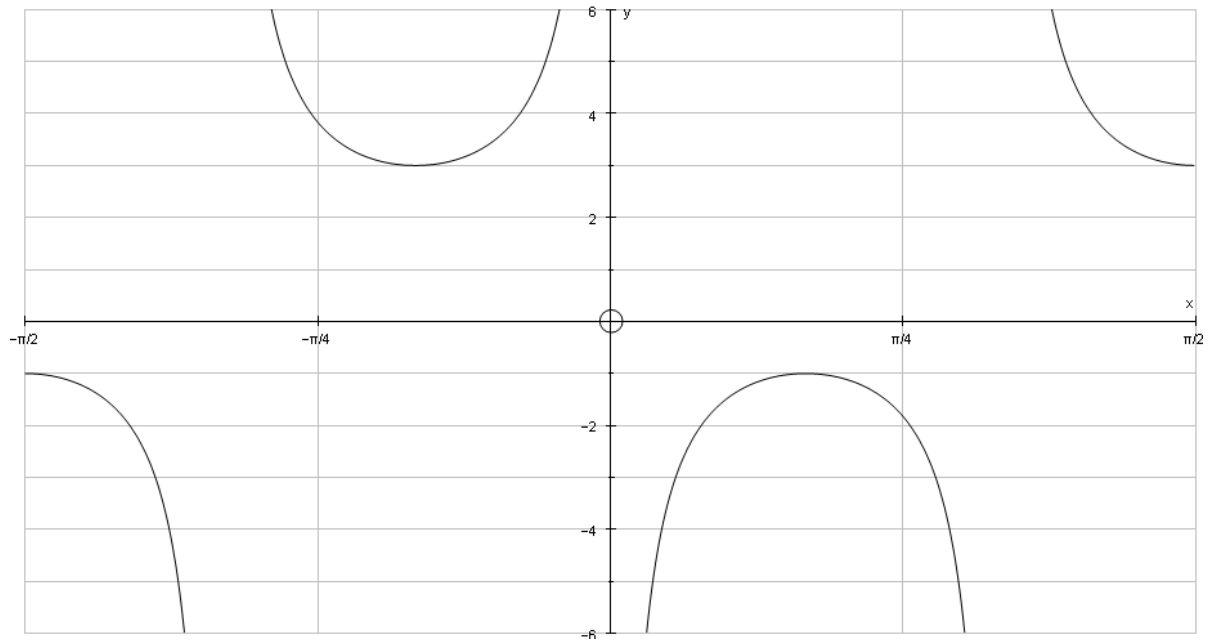
1. Explain why $\sin^{-1}\left(\sin\left(\frac{5\pi}{3}\right)\right)$ is not equal to $\frac{5\pi}{3}$. **(2M)**

2. Evaluate the exact value of $\sin\left(\cos^{-1}\left(-\frac{1}{2}\right)-\cot^{-1}\left(\frac{-5}{12}\right)\right)$. **(4M)**

3. Sketch the graph of $y=\frac{6}{\pi}\tan^{-1}(x+1)$ on the provided axes, labeling all intercepts and asymptotes. **(3M)**



4. Use the provided graph of $y = A\csc(Bx) + D$ to determine the values of *A*, *B*, and *D*. **(3M)**



5. Solve the following trigonometric equations for all solutions in the given domains: **(6M)**

a. $1 - 2\cos^2\theta = \sin\theta,\ \pi < \theta \le 3\pi$

b. $\sqrt{2}\cos(4\theta) + 1 = 0,\ -180° < \theta \le 0°$

6. Prove the following trigonometric identities: **(6M)**

a. $\sin 4\theta = \dfrac{4\cos\theta}{\csc\theta} - 8\sin^4\theta\cot\theta$

b. $\dfrac{\sec\theta + 1}{\tan\theta} = \dfrac{\tan\theta}{\sec\theta - 1}$

SECTION B: Calculator Active – 5 minutes

7. On April 5 2011 in The Bay of Fundy in Nova Scotia, Canada, high tide occurs at 8:00 a.m., and the tide marker at the harbor measures high tide to reach a height of 21 meters. Later that day, low tide occurs at 2:00 p.m., and the tide marker at the harbor measures low tide to reach a height of 4 meters. **(6M)**

a. Find a function $h(t)$ that models the height of the tide in The Bay of Fundy on April 5 2011, where $h(t)$ represents the height of the tide t hours after midnight.

b. Use your function $h(t)$ to predict the times of day on April 5 2011 at which the tide in The Bay of Fundy will have a height of 8 meters.

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:

A FEW HELPFUL TRIGONOMETRIC IDENTITIES

$$\csc A = \frac{1}{\sin A}$$

$$\tan^2 A + 1 = \sec^2 A$$

$$\cot^2 A + 1 = \csc^2 A$$

$$\sin(A + B) = \sin A \cos B + \sin B \cos A$$

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

$$\sin 2A = 2 \sin A \cos A$$

$$\cos 2A = \cos^2 A - \sin^2 A = 2\cos^2 A - 1 = 1 - 2\sin^2 A$$