

Name: _____

Student ID: _____

Test 3

This test is graded out of 44 marks. No books, notes, graphing calculators or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work.

Question 1. What angle θ ($0^\circ \leq \theta < 360^\circ$) is co-terminal to

a. (2 marks) 1020°

b. (2 marks) $\frac{23\pi}{4}$

Question 2. Consider an angle θ in standard position, find the quadrant in which its terminal edge lies, if

a. (2 marks) $\sec \theta < 0$ and $\cot \theta > 0$

b. (2 marks) $\sin \theta < 0$ and $\cos \theta > 0$

Question 3. (4 marks) Find the values of the 5 other trigonometric functions, if $\sin \theta = -\frac{2}{3}$ and $\sec \theta > 0$.

Question 4. (4 marks) A forest scientist called Bruno measures the angle of elevation from the ground to the top of a tree and finds the angle to be 75° . If Bruno is 22m from the tree, how tall is the tree?

Question 5. (4 marks) Draw the two “special triangles” which help identify the special angles. Label the angles of the triangle and the length of each side.

Question 6. Find the exact values of

- a. (2 marks) $\sec 150^\circ$
- b. (2 marks) $\tan 300^\circ$

Question 7. Find the exact values of

a. (2 marks) $\csc \frac{\pi}{4}$

b. (2 marks) $\cos \frac{-11\pi}{6}$

Question 8. (4 marks) Sketch the graph of the function $f(x) = 2 \sin(\pi x)$ over the interval $[0, 4]$.

Question 9. (4 marks) Verify the following identity:

$$\tan \theta + \cot \theta = \sec \theta \csc \theta$$

Question 10. (4 marks) Solve for θ :

$$4\cos^2 \theta - 3 = 0$$

Question 11. (4 marks) Find the value of:

$$\tan \left[\arccos \left(\frac{x}{3} \right) \right]$$

Bonus. (2 marks)

Sketch the graph of $\tan \theta$ over the interval $[-\pi, \pi]$.