

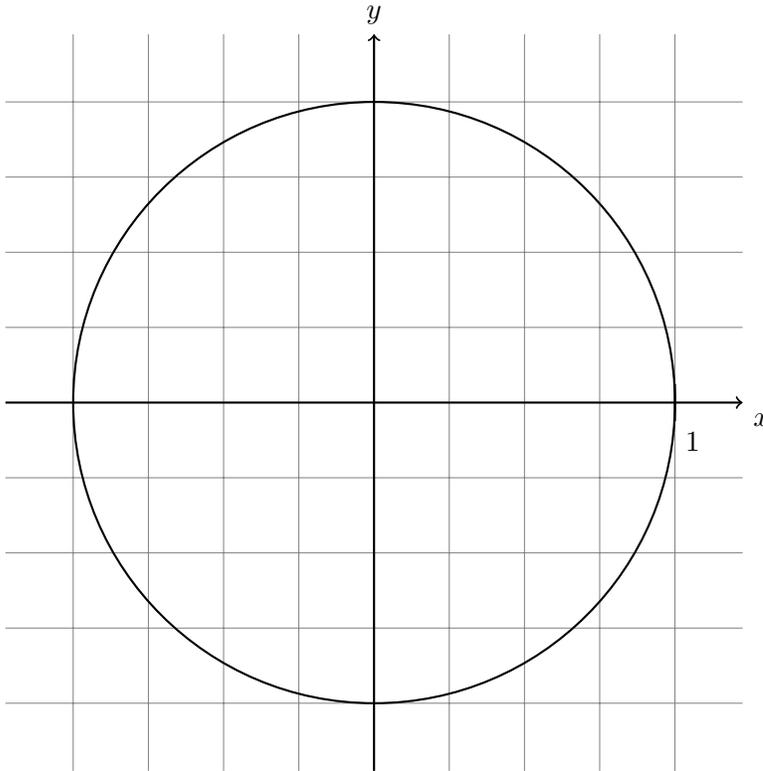
MAT 1275
Spring 2018
Professor K. Poirier
Test #3 Version B
May 10

Name (Print): _____

Total: 50 points
Time Limit: 50 Minutes

This exam contains 12 problems. **Choose 10 of the 12 questions to complete. If you answer more than 10, only the first 10 will be graded.** Each question is worth 5 points including 1 point for style. Answer all questions in your blue book. You may use a calculator on this test. No other aids are allowed. Show all your work for full credit.

1. (a) Use the definitions that you learned in the activity to complete and label the following diagram of the unit circle. Include the following labels
- θ (you will have to make a choice here; any choice is okay)
 - $\sin(\theta)$
 - $\cos(\theta)$



- (b) In words, describe how the functions $\sin(\theta)$ and $\cos(\theta)$ are defined. You may refer to your above diagram if you wish. [Hint: think back to the spring break activity, the follow-up quiz, or many of the lessons from this unit.]

2. Solve the triangle $\triangle ABC$. Answers must be correct up to 4 decimal places.

$$A = 90^\circ, B = 25^\circ, a = 8$$

3. Let $\theta = \frac{5\pi}{6}$.

- Determine which quadrant θ belongs to.
- Find the reference angle for θ .
- Find the point where θ intersects the unit circle.

4. Without using a calculator, state the exact value of the following trig functions for the specified angles. Show your work.

- $\cos\left(\frac{\pi}{3}\right) =$
- $\cos\left(\frac{2\pi}{3}\right) =$
- $\cos\left(\frac{5\pi}{3}\right) =$
- $\cos\left(\frac{-11\pi}{3}\right) =$

5. For the information given, find the values for the five remaining trig functions for θ :

$$\tan(\theta) = 2 \text{ and } \cos(\theta) < 0$$

6. Identify the amplitude and period (in radians). Sketch the graph. Show at least two periods. Label your axes and indicate the scale. Ensure that your intercepts and maximum and minimum points are plotted carefully.

$$y = 3 \sin(2\pi x).$$

7. Use fundamental trigonometric identities to prove the following:

$$\cot(x) + \tan(x) = \csc(x) \sec(x).$$

8. Use fundamental trigonometric identities to prove the following:

$$1 - \cos^2(x) = \sin(x) \tan(x) \cos(x).$$

9. Find all solutions (in radians) in $[0, 2\pi)$:

$$4 \cos(x) = -2\sqrt{3}.$$

10. Find all solutions (in radians) in $[0, 2\pi)$:

$$4 \sin^2(x) - 3 = 0.$$

11. Solve the triangle $\triangle ABC$. Round your answer to 4 decimal places.

$$C = 32^\circ, B = 81^\circ, b = 13$$

12. Find all solutions $\triangle ABC$. Round your answer to 4 decimal places.

$$a = 6, b = 9, A = 30^\circ$$