

Math 1155, Fall 2009, Exam II

Name:

Section:

Instructions: This is the second exam for Math 1155, Intensive Precalculus. You have 50 minutes to complete the test. Do not start until you are told to begin.

When you receive this booklet, count the pages to be sure that you have every page. There should be 8 pages, including this cover sheet. No notes or books are allowed on this exam. Scientific calculators are allowed, however, calculators with graphing capabilities may not be used. You should simplify all fractions and square roots when they appear in your answer. For decimal answers, round angles to at least 1 decimal place and other numbers to 3 significant figures.

I expect you to use notation correctly and may penalize you for failing to do so. In particular, an equal sign should appear between two things that are equal; an equal sign should not appear between two things that are not equal. For full credit on a problem you must show the final correct answer and give a reasonably neat and logical account of how you got that answer.

There are a total of 50 points, distributed among 9 problems. The problems are worth varying amounts. You must show your work for all problems. Little or no credit will be given for unsupported answers. Even if you can do the problems in your head, you must convince me that you know what you're doing. Good luck.

Problem	Points	Possible
1-5		20
6		5
7		5
8		8
9		12
Total		50

This is the multiple choice portion of the exam. Circle all answers that are correct. There will only be one correct answer to a question. No partial credit on these.

1. (4 points) Which of the following equals $\cos(-\frac{\pi}{6})$?

(a) $\cos \frac{5\pi}{6}$

(b) $\cos \frac{7\pi}{6}$

(c) $\sin \frac{\pi}{3}$

(d) $\cos \frac{\pi}{3}$

(e) None of these

2. (4 points) What is the graph of the equation $2x = x^2 + y^2$?

(a) A circle of radius 1 centered at (1,0)

(b) A circle of radius 1 centered at (0,1)

(c) A circle of radius 2 centered at (0,1)

(d) A parabola with vertex at (1,1)

(e) None of these

3. (4 points) How many degrees is $\frac{7\pi}{10}$ radians?

- (a) 56
- (b) 98
- (c) 126
- (d) 154
- (e) None of these

4. (4 points) If $\sin \theta = \frac{3}{4}$ and θ is in the second quadrant, then what is $\tan \theta$?

- (a) $\frac{3}{\sqrt{7}}$
- (b) $-\frac{3}{\sqrt{7}}$
- (c) $\frac{\sqrt{7}}{3}$
- (d) $-\frac{\sqrt{7}}{3}$
- (e) None of these

5. (4 points) Let $f(x) = -2 \cos(\frac{4\pi}{3}x)$. What are the amplitude and period?

(a) Amplitude: -2, Period: $4/3$

(b) Amplitude: 2, Period: $4/3$

(c) Amplitude: 2, Period: $3/2$

(d) Amplitude: -2, Period: $3/2$

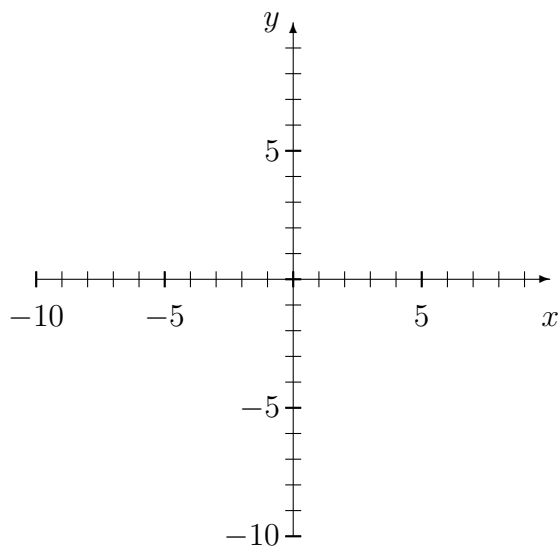
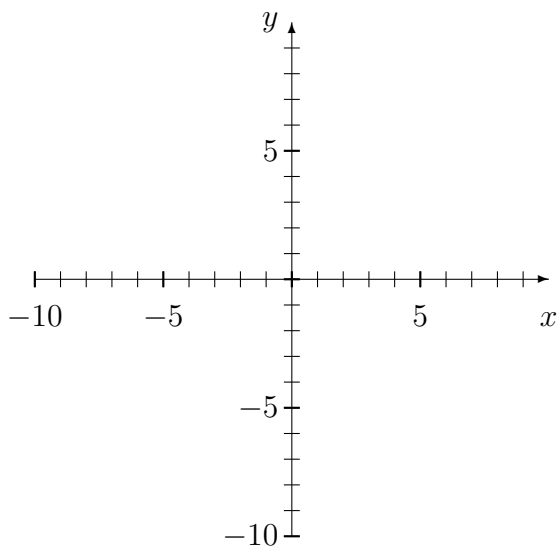
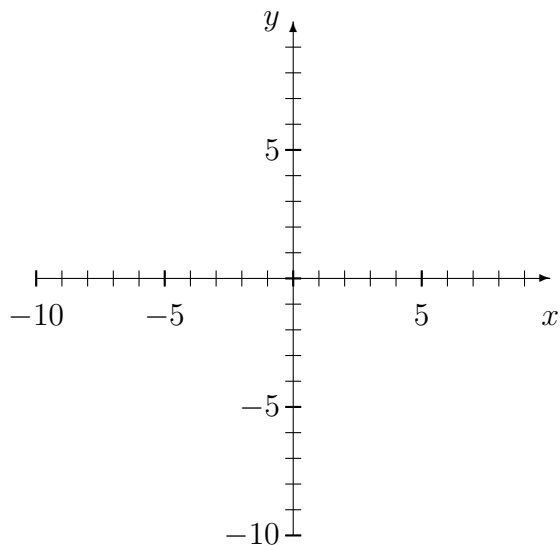
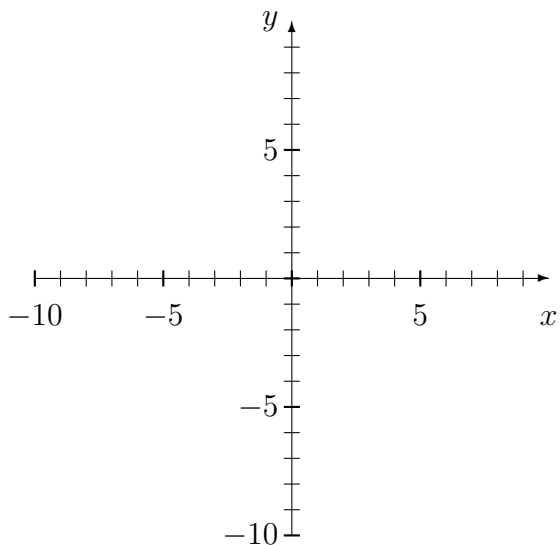
(e) None of these

6. (5 points) Fill in this table with exact values.

	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin					
cos					

7. (5 points) A bicycle tire is 50cm in radius, and the bicycle that it is attached to is traveling 10 m/s. Find how fast the tire is rotating in radians per second.

8. (8 points) Graph $y + 3 = |-(x + 1)|$ by first graphing $y = |x|$ and then applying transformations. Label clearly what equation is in each graph.



9. (12 points) Consider the functions

$$f(x) = \frac{1}{\sqrt{x+3}}$$

$$g(x) = \frac{1}{x^2} - 3.$$

(a) Find the domain and range of $f(x)$. (Hint: For the range, first ask yourself “What are the possible outputs of \sqrt{x} .”)

(b) Find $f^{-1}(x)$ and its domain.

(c) Find the domain and range of $g(x)$. (See previous hint, and adapt it)

(d) Are $f(x)$ and $g(x)$ inverses? Explain.