Study guide for the final exam

Just like any other final exam, this exam will be comprehensive, and is going to be worth 35 percent of your grades. So, you must take it very seriously, and you should spend time studying, going over old materials, and relearning the topics. This package contains all 3 tests given to you during this semester (in case you have misplaced them), and a few practice exercises which were not covered on tests.

This package is not a representative of the final exam, nor should this be a unique source of study. You should

1. First go over everything covered in class: lecture notes, examples, worksheet, homework, etc...
2. Second, use this package as a guide to test your own knowledge.
3. Thirdly, come to my office hours, if you need help, or go to the tutors.

Precalculus Exam 1

Wed Sept 14th

Instructor: Vignon S. Oussa Name_____

Instructions: please, show all your work very clearly and precisely. Any unsupported work will receive no credits.

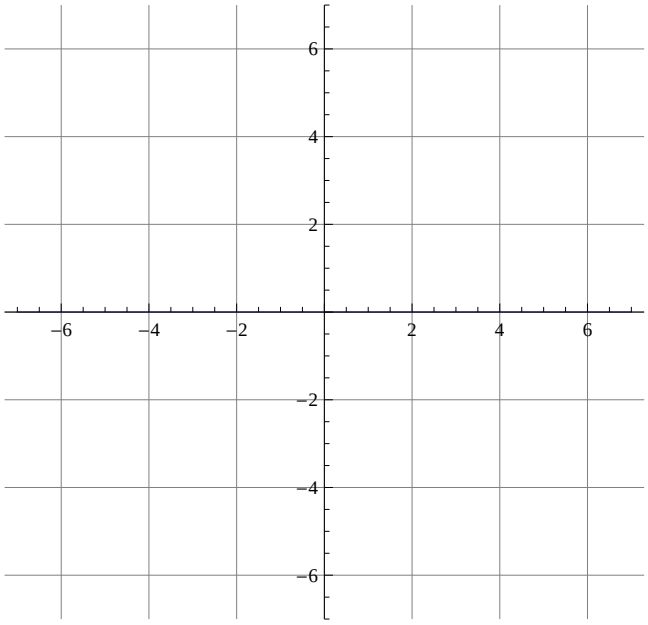
1. (10 points) Find the domain and range of the function

$$f(x) = \sqrt{x-1}.$$

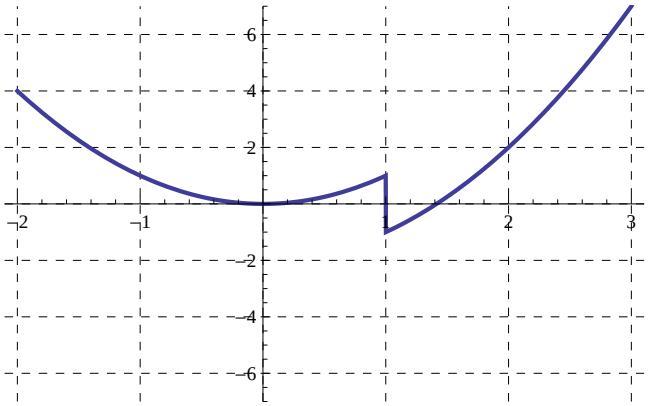
Write both answers in interval notations

2. (10 points) Use graph transformations to sketch the graph of

$$g(x) = (x-1)^2 + 2$$



3. (10 points) Sketch the graph of $y = -f(x)$ if the graph of $f(x)$ is below



4. (10 points)Given $f(x) = 2x - 1$ and $g(x) = x + 2$, compute $f \circ g(x)$.

5. (10 points) Find the inverse of $f(x) = 2x + 3$.

6. (10 points) The graph of $y = x^2$ is translated 2 units to the left and 4 units downward. Write the equation of the graph after the indicated transformations.

Precalculus Exam II
Wed October 12th

Instructor: Vignon S. Oussa Name_____

Instructions: please, show all your work very clearly and precisely. Any unsupported work will receive no credits. No calculator allowed.

1. **5 pts** Find the equation of the line passing through the point $(2,3)$ and perpendicular to the line whose equation is $y = 2x-1$ in slope-intercept form

2. **5 pts** Solve this equation by completing the square $x^2 + x - 2 = 0$.

3. **5 pts** Solve this equation by using the quadratic formula $2x^2 + 3x = 2$.

4. **6 pts** Answer the followings.
   1 degree $= A$ seconds.
   1 second $= B$ minutes.
   1 minute $= C$ radians.
   Find A, B and C.

5. **5 pts** Convert the angle 10.60° to degree-minute-second form.

6. **20 pts** Without a calculator, find the followings.

(a) $\cos(-\frac{\pi}{2})$

(b) $\tan(\frac{11\pi}{4})$

(c) $\sin(\frac{5\pi}{3})$

(d) $\cot(\frac{\pi}{6})$

Precalculus Exam III

1. (2 pts) Given $f(x) = 2\cos(x-1)$,

   (a) Find the amplitude of f.

   (b) Find the phase-shift of f.

2. (2 pts) Find the exact value of $\arcsin(1/2)$.

3. (5 pts) Establish the following identity.

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

4. (5 pts) Use the fact that $\frac{\pi}{12} = \frac{4\pi}{12} - \frac{3\pi}{12}$, to find the exact value of $\cos\left(\frac{\pi}{12}\right)$ in radical form.

5. (5 pts) Using the half angle formula, find the exact value of $\sin(15°)$ in radical form.

6. (a) (5 pts) If it is known that $\sin\alpha = 3/5$, $\pi/2 < \alpha < \pi$, find $\cos\alpha$.

(b) (3 pts) Without a calculator, find $\arcsin(\sin(11\pi/3))$. Show work.

Exam

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the equation on the interval $0 \le \theta < 2\pi$.

1) $4 \sin^2 \theta = 1$ 1) _____

2) $\tan \frac{\theta}{2} = \frac{\sqrt{3}}{3}$ 2) _____

Solve the equation. Give a general formula for all the solutions.

3) $\sin \theta = \frac{\sqrt{3}}{2}$ 3) _____

Solve the equation on the interval $[0, 2\pi)$.

4) Suppose $f(x) = \cos \theta - 1$. Solve $f(x) = 0$. 4) _____

Establish the identity.

5) $\sin^2(-\theta) + \cos^2(-\theta) = 1$ 5) _____

6) $(1 - \cos x)(1 + \cos x) = \sin^2 x$ 6) _____

Find the exact value of the expression.

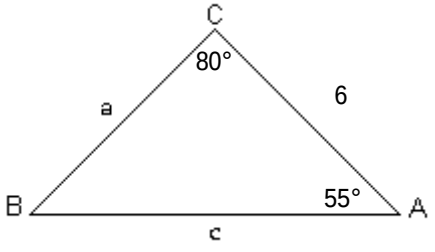
7) $\cos \frac{5\pi}{12}$ 7) _____

8) $\sin 215° \cos 95° - \cos 215° \sin 95°$ 8) _____

9) $\sin 165°$ 9) _____

Solve the triangle.

10) 10) _____



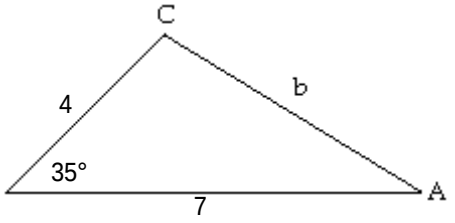
Two sides and an angle are given. Determine whether the given information results in one triangle, two triangles, or no triangle at all. Solve any triangle(s) that results.

11) $a = 7, b = 9, B = 49°$ 11) _____

12) B = 90°, b = 5, a = 25 12) _____

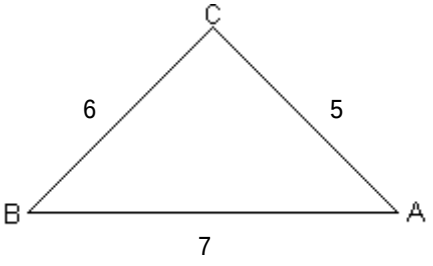
Solve the triangle.

13) 13) _____



14) a = 3, c = 1, B = 90° 14) _____

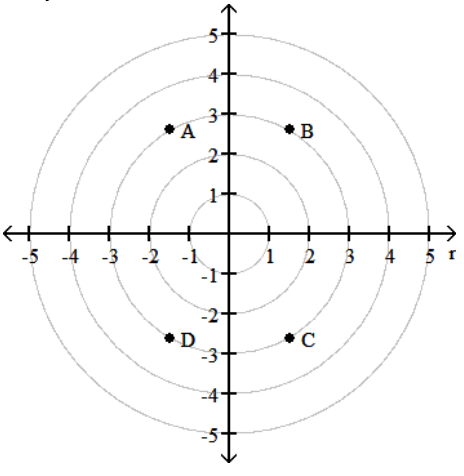
15) 15) _____



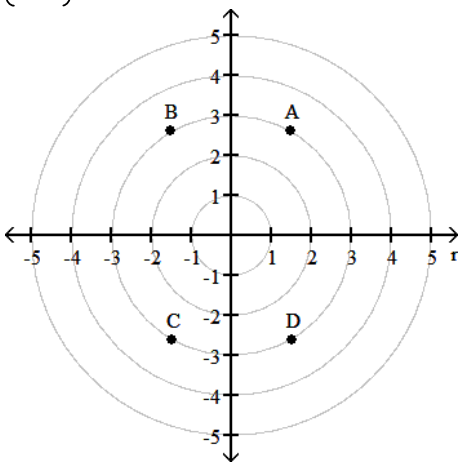
16) a = 11, b = 11, c = 8 16) _____

Match the point in polar coordinates with either A, B, C, or D on the graph.

17) $\left(3, -\frac{5\pi}{3}\right)$ 17) _____



18) $\left(3, \frac{\pi}{3}\right)$ 18) _____



The polar coordinates of a point are given. Find the rectangular coordinates of the point.

19) $\left(7, \frac{2\pi}{3}\right)$ 19) _____

20) $\left(5, -\frac{4\pi}{3}\right)$ 20) _____