Precalculus. Test #3. Spring 2013 Name_____
Sections 1.1-4.4-6.4. Class time of day, section, or instructor_____

CORRECT ANSWERS WITH LITTLE OR NO SUPPORTING WORK WILL RECEIVE LITTLE OR NO CREDIT. Include three or more correct significant digits when giving numerical answers.

#	Points	Score
1	3,4,3,3,6 = 19	
2	5	
3	8	
4	10	
5	8	
6	5,5	
7	8	
8	8	
9	12	
10	12	
total	100	

1. Short answer. [No work need be shown.]
a) An earthquake is a 6.0 on the Richter scale.
What is the amplitude of its waves?
[Be sure to include units.]

b) A sound is 60 db. A second sound is 10,000 times as loud.
i) What is its decibel level?
ii) Is that above the threshold of pain?

c) Here is an exponential fact: $10^{x}(10^{y}) = 10^{x+y}$
State, in symbols, the corresponding log fact.

d) Rewrite "$5.2 < x < 5.8$" in the form "$|x - c| < d$."

e) Consider the function $f(x) = \dfrac{(2x-5)(x+7)}{(x-3)}$. Give its

1) zeros

2) vertical asymptotes

3) horizontal asymptotes

4) end-behavior model

2. For the remaining problems, SHOW WORK!
If $(1.04)^{12t} = e^{kt}$, for all t, find k.

3. Solve for t: $(1.12)^t = 1.5(1.04)^{2t}$

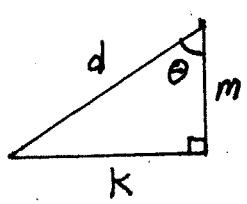
4. The intensity of light that passes through a fiber-optic cable depends upon the clarity of the glass and the distance it travels. The formula is $I(d) = I(0)e^{-kd}$, where d is the distance traveled, k is a parameter which describes the clarity of the glass, $I(0)$ is the initial intensity at one end, and $I(d)$ is the intensity at distance d. If 20 percent of the light intensity remains at 3 miles, at what distance will 1 percent remain?

Trigonometry: Set your calculator to DEGREE mode.

Law of Cosines: $c^2 = a^2 + b^2 - 2ab \cos C$. Law of Sines: $(\sin A)/a = (\sin B)/b$.

5. The figure is a right triangle.

a) If $k = 49$ and $d = 59$, find θ.

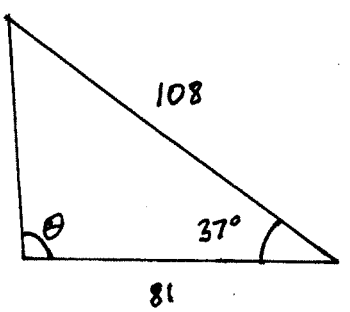


b) If $\theta = 54°$ and $k = 200$, find m.

6. a) Reproduce the picture we used to illustrate a 30-degree angle in a right triangle, and label its sides with the lengths we used. Then read the picture to give the exact (not decimal) value of tan(30°)

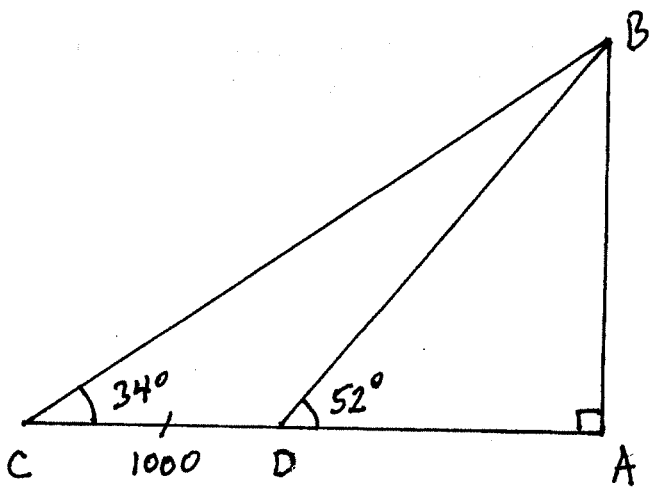
b) i) Which geometric case is the most interesting because it may yield two distinct triangles?
ii) Sketch a picture (like the ones in the text) to illustrate how two different triangles can result.

7. Two sides are 81 and 108 and the angle between them is 37 degrees, as illustrated. Find the marked angle. Show work [As on every problem, the correct answer with little or no justification will get little or no credit. We always expect you to use your calculator to minimize the computations you show, but tell us what law you used.]



8. The angle between two sides of a triangle is 60 degrees. One of those two sides is 40 percent longer than the other. The area of the triangle is 80. How long is the shorter of those two sides?

9. [See the picture.] ABC is a right triangle, as labeled. Find AB.
Angle $C = 34°$, angle $D = 52°$, and CD = 1000 feet.
Label the picture with your steps (1), (2), (3), etc. and fill in the results as you discover them.
[If we can't easily follow your steps and work, you may not get credit for them.]



10. From A to B is 2 miles, N 40°E. From B to C is 1.2 miles, S 30°E. [See the picture]
How far, and at what bearing, is it from C to A?
Label the picture with your steps (1), (2), (3), etc. and fill in the results as you discover them.
[If we can't easily follow your steps and work, you may not get credit for them.]