

University of South Carolina
Math 222: Math for Elementary Educators II
Instructor: Austin Mohr
Section 002
Fall 2010

Midterm Exam (Version 2)

Due Wednesday, December 8

For problems involving trigonometry, make sure your calculator is in degree mode, not radian mode.

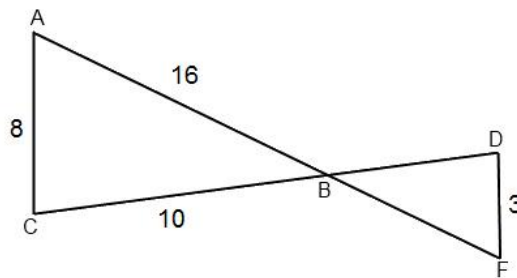
Definitions

1. similar triangles
2. simple (three-dimensional version)
3. convex
4. polygon
5. polyhedron
6. prism

Computation

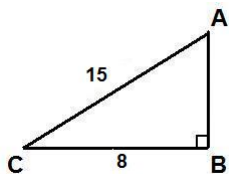
Provide the requested information for each question. Show all your work.

7. Refer to the figure below for the following questions. You may assume that side \overline{AC} is parallel to side \overline{DF} .



- a. Show that the big triangle on the left is similar to the small triangle on the right.
- b. Sketch the two triangles side-by-side (with the vertices labelled) so that they are oriented the same way.
- c. Find the length of side \overline{BF} .

8. Find all missing sides and angles in the triangle below. You may *not* use the Pythagorean Theorem.



9. The following two questions are unrelated. You will not use part a to solve part b.
- This question was discarded from the midterm, so you do not need to correct it.
 - Water is being added to a tank at a constant rate. Three seconds after the filling began, the tank contained 30 gallons of water. Eleven seconds after filling began, the tank contained 46 gallons. Write a linear equation to describe the change in the volume of water over time. Be sure to specify the meaning of the variables x and y .

Short Answer

Give a short response to each of the following questions. Do *not* give a full proof.

- How many lines are determined by four points if no three of them are collinear? Explain.
- Is every square a kite? Is every kite a square? Explain.
- Can there be a regular polyhedron with three octagons meeting at every vertex? Why or why not?
- This question was discarded from the midterm, so you do not need to correct it.