

Review for 3rd exam
Ma 310 002
Problem Solving for Teachers
April 27 2004, version -1

Instructions: *This is the common version of the current state of the review for test 3. Work through the problems and bring to class Thursday.*

Standards for the exam:

1. You will be able to spot errors in the statement of problems, and make corrections. This includes such things as grammatical errors, spelling errors, punctuation errors, logical errors, and mathematical errors. It also includes recognizing bad parameter values. It also includes making judgements about the use of a diagram in a given problem.
2. You will be able to analyse a proposed solution to a problem and decide if it is correct. If it is not correct, you will be able to correct the solution.
3. You will be able to solve problems of the sort that have been presented in the homeworks this class.
4. You will be able to take a given problem, parameterize it, and solve it, or discuss difficulties that prevent you from carrying out the solution to the parameterized problem.
5. You will be able to take a given problem, and use it as a source of inspiration to come up with another related problem.
6. You will be able to take a given set of standards and make a problem or problems which test one or more specified standards from the set.
7. You will be able to decide (and defend your decision) if a given problem tests a given standard.

1. Suppose you have posted a 7 question homework of multiplicity 5 for a class of 6. How many different possible personal versions are there? (Remember the first problem of each group is reserved for the common version.)

Circle correct answer:

'5'7'7'! '4'6'6'! '5'6'6'! '4'7'7'!

2. Suppose the triangle with vertices (0,0), (3,0) and (2,4) is translated by the vector (3,0). What is the area of the figure that is swept out by the triangle as it moves to its new position?

Area = _____

3. Choose 4 points at random on a circle. What is the probability that they all lie in some semicircle?

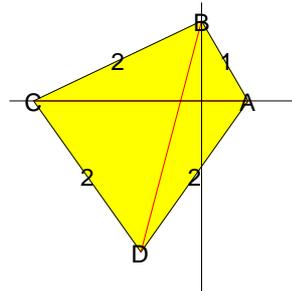
4. For counting purposes, we agree that two book shelves are the same if they each have the same number of books, and counting from left to right, the i th book on one shelf has the same color and height as the i th book on the other shelf. Now, using books which are red, yellow, or green in color and 10 or 12 inches in height, how many different shelves with 3 books are there? You may assume a sufficient supply of each kind of book. Answer: _____

How many of these shelves are 'defective' in that not all heights are represented? Answer:

5. Suppose the segment from $(2,0)$ to $(4,0)$ is rotated 90 degrees counter clockwise. What is the area of the figure that swept out by the segment as it moves to its new position?

Area = _____

6. In the quadrilateral drawn below, A and C are on the x axis, B is on the y axis and the sides have the lengths shown.

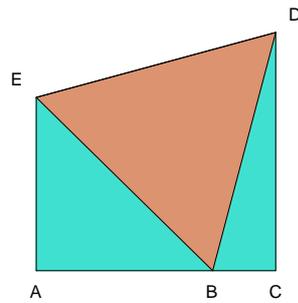


Find the coordinates of D, if the x coordinate of A is .5.

x = _____ , y = _____

Hint: First find the coordinates of B and C.

7. The trapezoid ACDE shown below has an inscribed equilateral triangle EBD. Angle A and angle C are right angles. If $AE = 8$ and $CD = 11$, what is the side of the triangle?



Answer = _____

8. Suppose you have posted a 7 question homework of multiplicity 5 for a class of 6, two of whom are Bob and Bill. What is the probability that Bob's homework and Bill's homework do not have a problem in common? (Remember the first problem of each group is reserved for the common version.)
