

Name: _____

Math 402 - Test #2 - March 7, 2007

Time: 50 minutes. Write your answers on the blank paper provided. Start a new page for each problem and be sure to number the problems. You may not use any books or notes. There are 100 points possible.

1. (7 points) Give the definition of similar triangle.
2. (7 points) Let f be a transformation. Define “ P is a fixed point of f .”
3. (5 points each part) Decide whether each of the following is an isometry or not. Give a brief explanation of your reasoning. You are not asked for a formal proof.
 - (a) $f(x, y) = (-x, y)$
 - (b) $f(x, y) = (x^2, y^2)$
 - (c) $f(x, y) = (x + 1, y + 2)$
4. (10 points) Give the statement of Pasch’s Axiom.
5. (15 points) Prove that a line intersecting one side of a rectangle, at a point other than one of the vertices of the rectangle, must intersect another side of the rectangle.
6. (5 points) Give the statement of Playfair’s Postulate.
7. (25 points) Prove that the statement “Two lines that are parallel to the same line are coincident (the same) or themselves parallel” implies Playfair’s Postulate.
8. (4 points each part) Answer True or False for each part. No explanation is needed and there is no partial credit.
 - (a) If an isometry has two distinct fixed points, then it has an infinite number of fixed points.
 - (b) Every isometry has at least one fixed point.
 - (c) The image of a parallelogram under an isometry is a parallelogram.
 - (d) It is possible to prove Playfair’s Postulate from Euclid’s five postulates.