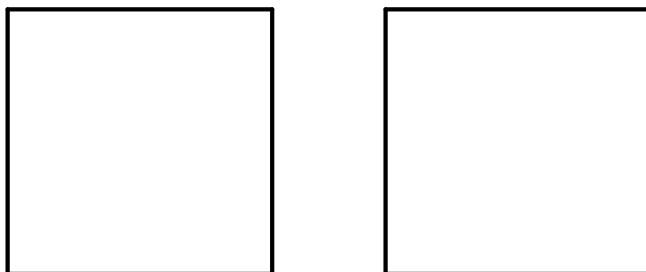


MA241: Pythagorean Theorem Worksheet

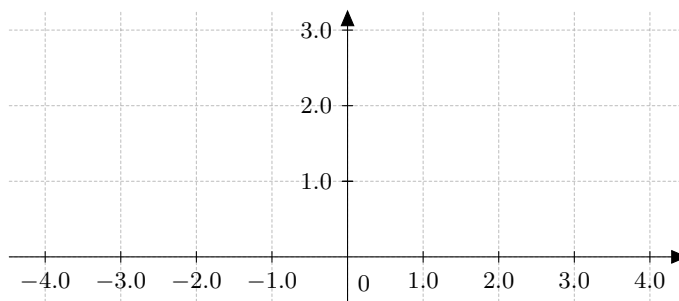
11/25/14

- (1) For this problem, use the diagram in 3.1, page 39 of your textbook. Do not use the Pythagorean Theorem in Problem 1.
 - (a) For each of the three triangles, find the area of the adjacent squares (a^2 , b^2 , and c^2) and use these areas to find the length of each side (a , b , and c).
 - (b) Make a conjecture about the relationship between a^2 , b^2 , and c^2 depending on whether a triangle is acute, right, or obtuse.
 - (c) Draw another acute triangle and another obtuse triangle and see if your conjecture is true for these.
- (2) Cut out the colored shapes on the last page and put them together as directed.

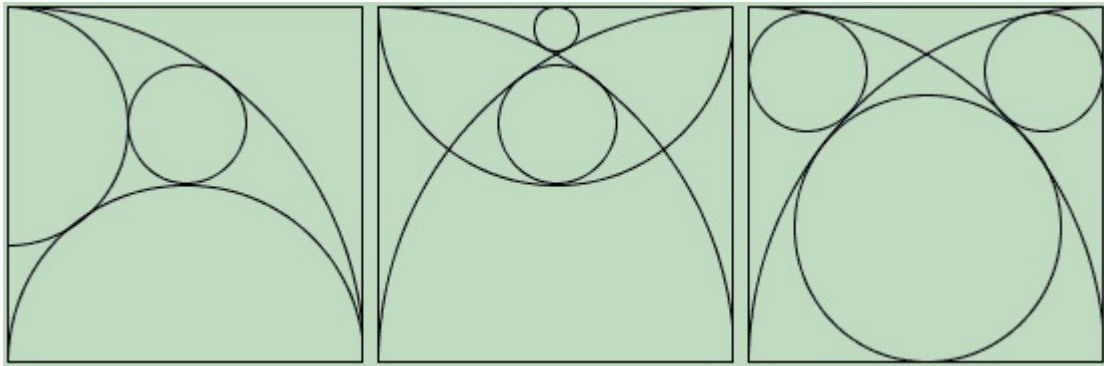
- (a) In the squares below, make a sketch of how you assembled the pieces.



- (b) If the sides of the small triangles are a , b , and c (in increasing order), what is the length of one side of the big square in part (a)? Use this to find the area of the big square.
 - (c) Now take the big square from (a) that contains the pink square (the one with sides of length c). Write the area of this square as a sum of the area of each puzzle piece.
 - (d) Combine your answers from (b) and (c) to get the familiar Pythagorean Theorem.
- (3) Suppose you have two points in the coordinate plane, $A = (x_1, y_1)$ and $B = (x_2, y_2)$.
 - (a) Use the Pythagorean Theorem to find a formula for the distance from A to B .
 - (b) Pick values for A and B , plot the points, and find the distance between them. Choose your points so that the distance is not a rational number (so the reduced form should contain a radical).



- (4) Do problems 13 and 14 on page 51. You do not need to show your work, just make sure you understand your answers.
- (5) Read the introduction to problem 32 on page 56. Use this idea to do problems 33 through 38. Write one sentence giving all your answers and briefly explaining them.
- (6) Using any unit of measurement (if you don't have a ruler, improvise!), draw a copy of the Wheel of Theodorus pictured on page 61. Label all the side lengths, including the spokes of the wheel.
- (7) (Bonus – you don't have to do this) This comes from a Japanese Sangaku puzzle. In the diagram below, use the Pythagorean Theorem to find the relative radii of all the circles.



Puzzle for Problem 2

Print out this page and cut out each colored shapes below. Arrange the 11 puzzle pieces to fit exactly into the two puzzle frames.

