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.

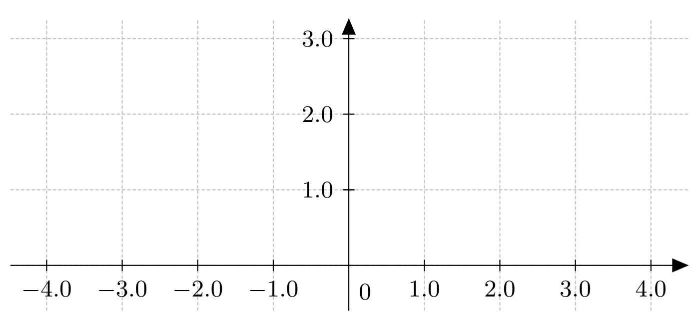
(a) For each of the three triangles, find the area of the adjacent squares (a^2, b^2, and c^2) and use these areas to find the length of each side (a, b, and c).
(b) Make a conjecture about the relationship between a^2, b^2, and c^2 depending on whether a triangle is acute, right, or obtuse.
(c) Draw 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 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).

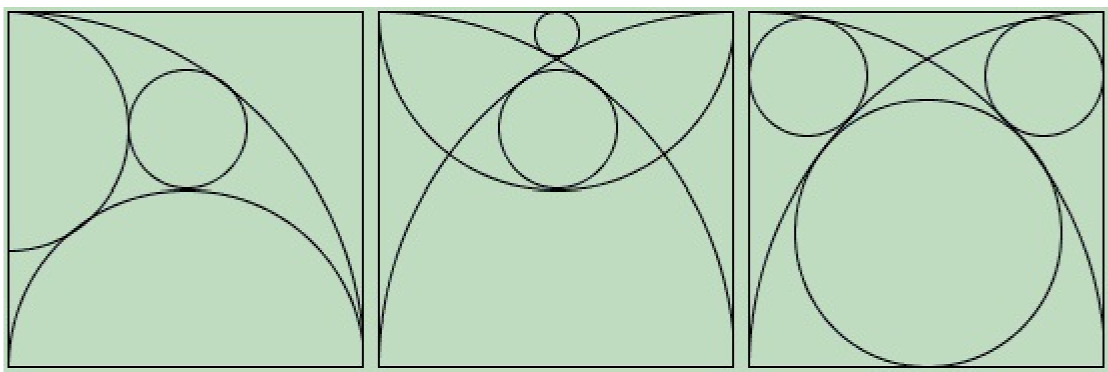


(4) Do problems 13 and 14 on page 51. You do not need to show your work, just make sure you understand your answers.

(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.