

Geometry

The Pythagorean Spiral Project

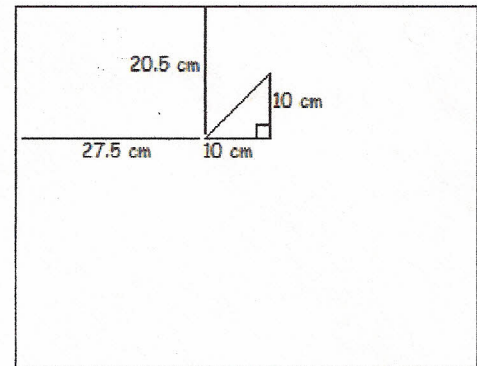
You will create a poster of the Pythagorean spiral. The result needs to be colored and creatively decorated. You will need to turn in your poster and the attached table with all calculations.

Materials:

- ✧ White poster board
- ✧ 90° corner triangle or protractor
- ✧ ruler (metric)
- ✧ pencil, colored pencils or markers

Step 1: Beginning in the correct location

Place the poster board on its side. With the poster board in this position, measure from the top left hand corner, 27.5 cm to the right and 20.5 cm down. This position will be the starting point for your diagram and is crucial to placing the full diagram on the poster board. (Diagram right)



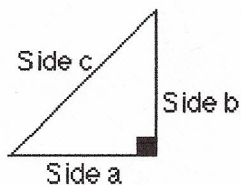
Step 2: Placing the triangle on the poster board

From the above starting point, use your ruler to draw a horizontal segment to the right that is 10 cm long. Use the triangle tool (or protractor) to measure a 90 angle. With the ruler, draw a vertical line 10 cm long to create the legs of an isosceles right triangle. Connect the two endpoints to draw the hypotenuse of the triangle. (See above)

Step 3: Calculate the Hypotenuse's Length

Use the Pythagorean Theorem to calculate the length of the hypotenuse. Show all work and write your answer in reduced radical form in the provided table.

I will do the first one for you:

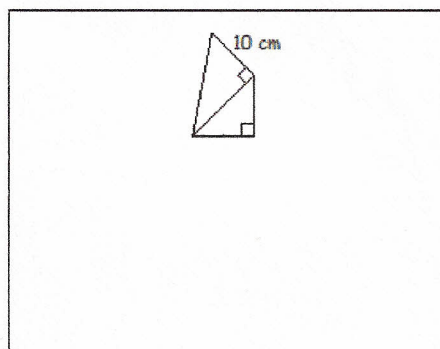


$$a = 10 \text{ cm} \quad b = 10 \text{ cm}$$

$$\begin{aligned} a^2 + b^2 &= c^2 \\ (10)^2 + (10)^2 &= c^2 \\ 100 + 100 &= c^2 \\ 200 &= c^2 \\ \sqrt{200} &= c \\ \sqrt{100 * 2} &= c \\ 10\sqrt{2} &= c \end{aligned}$$

Step 4: Beginning the Spiral Effect

Create another right triangle on top of the previous hypotenuse by drawing a segment of length 10 cm that is perpendicular to the old hypotenuse. Connect the two segments to form a new hypotenuse. (The previous hypotenuse is one leg, and the 10 cm segment is the other leg.)



Step 5: Calculate the new Hypotenuse's length

On the attached table, show the calculations to find the length of the new hypotenuse.

Step 6: Keep going

Continue to repeat this process of connecting and constructing new triangles with a side length of 10cm, using the previous hypotenuse as the other leg. Continue to show your calculations and side lengths on the attached table. Construct triangles until you have formed a full spiral.

Step 7: Coloring in the pattern

Detail your Pythagorean Spiral with a pattern. The pattern should be consistent with the pattern created by the Spiral. Be CREATIVE!!!!

Helpful Hints:

- Complete the assignment in pencil first, and then sharpen up the lines using a black marker
- When labeling the diagram PRINT CLEARLY.
- Use color and creativity to make the spiral pattern.
- Effort and creativity is rewarded!!!!

YOU WILL TURN IN:

1. Your poster with color used to decorate the pattern.
2. The attached table that includes your work for each hypotenuse length.

Examples:

