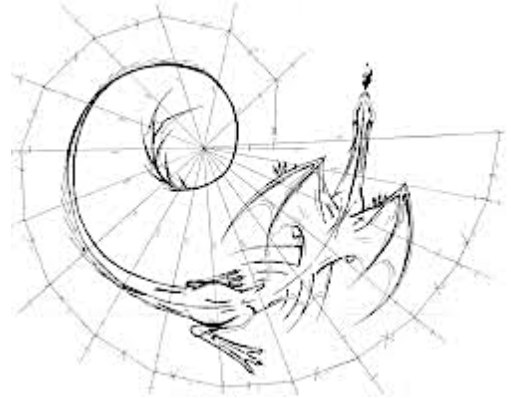



# PYTHAGOREAN SPIRAL mini-project

You are going to demonstrate your understanding of the Pythagorean theorem through the lens of an artist! You will apply the Pythagorean theorem to find the length of a triangle's hypotenuse and construct right triangles using a protractor. The final project will consist of: 1) an artistic spiral with clearly labeled lengths; 2) a separate worksheet with all hypotenuse calculations; and 3) a written reflection.



The following items must be included in your mini-project:

- A. INTRODUCTION: In your *own* words, explain all the separate tasks you must complete for this project. Your introduction paragraph should be typed and free of all spelling and grammatical errors.
- B. PYTHAGOREAN SPIRAL: Place the poster board in landscape orientation. Measure from the top left hand corner 15 cm right and 11 cm down. This will be the starting point for your diagram. It will assure that your diagram stays on the page. Using your ruler create a segment that is 5 cm across starting from the starting point and heading towards the center of the poster. Make this segment perpendicular to the side of the poster. Use your protractor to construct a congruent segment that is perpendicular to the original. Connect the endpoints of the two segments to create a right isosceles triangle. Using the hypotenuse of the first triangle, create another right triangle on top of the previous hypotenuse. The old hypotenuse will be the new base and construct a perpendicular segment to this, with a length of 5 cm. Then connect the two segments to form a new hypotenuse. Continue to repeat this process of connecting and constructing new triangles with a side length of 5 cm, using the previous hypotenuse as the other side. Construct triangles until you have formed a full spiral.
 
- C. SPIRAL ARTWORK: Once you have drawn all the triangles, add your artistic touch! Use color and add details... make the picture come to life with a foreground or background. BE CREATIVE!
- D. HYPOTENUSE CALCULATIONS: On a separate piece of graph paper, use the Pythagorean theorem to calculate the length of each hypotenuse. Show all work, and leave answers in radical form. Remember:  $\sqrt{5} \cdot \sqrt{5} = (\sqrt{5})^2 = 5$ .
- E. WRITTEN SUMMARY: This is not a summary or evaluation of the Pythagorean Spiral project. Rather, explain what you had to know in order to complete *you project*. Describe what you learned while working on your project. Include vocabulary terms and concepts that you have learned in this unit while explaining how they were applied in your project. Your summary should be typed free of all spelling and grammatical errors. **This is your chance to show what you have learned... so impress us!**
- F. SELF-ASSESSMENT: Using the rubric/checklist on the back of this sheet, assess your own project. Initial each task in the "student" column if you feel that you have completed that task. Put a check mark if you did not complete the task. Give yourself a "total score" at the bottom of the sheet based on the scoring rubric. Hint: if you find an incomplete or inadequate task, feel free to make changes or edit your work before you submit.

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

# PYTHAGOREAN SPIRAL mini-project

*Initial* each task in the “student” column if you feel that you have completed that task. Put a *check mark* if you did not complete the task. Give yourself a “total score” at the bottom based on the scoring rubric.

My spiral looks like: \_\_\_\_\_

Student Column	Teacher Column	<h1>Checklist</h1>
		1. I have an introduction in which I have fully explained my task in my <i>own</i> words. My introduction paragraph is typed and free of all spelling and grammatical errors.
		2. I have accurately and neatly drawn 17 right triangles that form a spiral. I have used a ruler and a protractor to measure the angles and lengths.
		3. I have clearly labeled every side length and hypotenuse. My measurements are labeled with units (cm) and are in reduced radical form.
		4. My spiral is creative. I have used color, added details, or drawn a background, etc.
		5. I have calculated each hypotenuse for the 17 triangles. I have shown all of my work and it is neat and organized.
		6. I have written an articulate summary that demonstrates my understanding of this unit using vocabulary terms and mathematical language.
		7. I have carefully completed this evaluation checklist, using the student column to record my initials or a checkmark. I have awarded myself a total score based on the rubric below.

# Rubric

- 20 WELL DONE: All work is high quality, neat, complete and well presented. Ideas are clearly expressed. All data is accurate.
- 15 ACCEPTABLE: Work is mostly complete, and presentation is still neat. Some data may be inaccurate but overall most data supports conclusions. Ideas may not be fully explained, but the basic requirements for a section have been met.
- 10 INCOMPLETE: Less than two-thirds of a requirement for a section has been done. Work is sloppy. Data is not accurate. Explanations lack depth or are unclear.
- 0 NOT DONE

**TOTAL SCORE:** student: \_\_\_\_\_ teacher: \_\_\_\_\_

(Note: your score can be any value between 0 and 20)