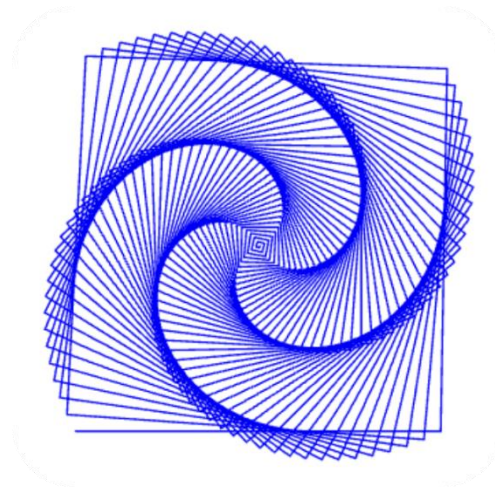




TINA 1 PROGRAMMING COURSE  
**STUDENT JOURNAL**

REVISED MARCH 6, 2016



NAME	
DATE STARTED	DATE COMPLETED
SCHOOL, CLASS, PERIOD	



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General Website: <https://nclab.com/>

Turtle Gallery : <https://nclab.com/turtle-gallery/>

Desktop (needs login information) <https://desktop.nclab.com/>

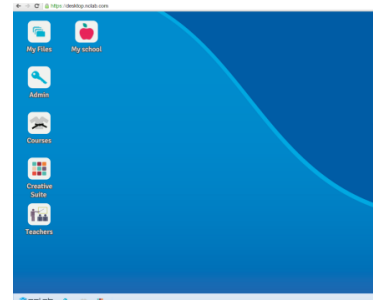
## LOGIN INFORMATION

Log in to account

<https://desktop.nclab.com/>

using the name and password provided to you by your teacher.

Select "Courses" (doubleclick)

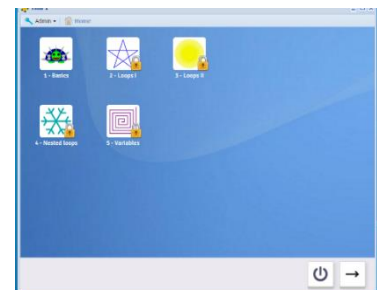
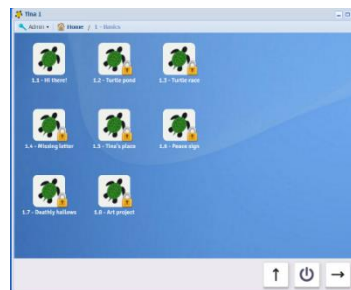


Select Tina Turtle and then Tina 1.



Select the Section (1-Basics) and Level (1.1.)

Note that only one section and level are available. The rest are locked until the section or level is successfully completed.



*Keep your login name and password in a safe place.*

## SECTION 1: BASICS

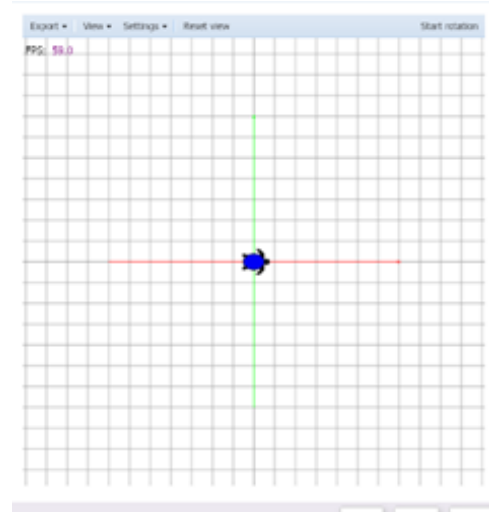
In Section 1, learn how the coordinate plane is used in Tina, how to move and turn Tina to draw lines, how to set color, line width, and use other controls.

To help you remember the parts of the coordinate plane, label the diagram to the right with the following:

Origin (0,0)

X axis

Y axis



Other coordinate plane basics:

The x axis runs \_\_\_\_\_ and is colored \_\_\_\_\_.

The y axis runs \_\_\_\_\_ and is colored \_\_\_\_\_.

The z axis is perpendicular to the x and y axis and is colored \_\_\_\_\_. It is not visible in 2 dimensions.

One grid space equals \_\_\_\_\_ units.

Tina's default position is ( , ) and she faces \_\_\_\_\_. Her default color is \_\_\_\_\_

Write the following commands. Don't forget details like parentheses.

Move Tina forward	
Turn Tina left	
Turn Tina right	

**COLOR:**

The color command for Tina is written: \_\_\_\_\_

Tina has many defined colors, including names like STRAWBERRY and STEEL. A valid defined color will look like \_\_\_\_\_.

Experiment with different names. List and describe some defined colors that you have discovered and may want to use..

COLOR NAME	Description	Sample

Describe the function of the following commands. Add any details that may be useful.

<code>tina.up()</code>	
<code>tina.down()</code>	
<code>tina.hide()</code>	
<code>tina.back(d)</code>	
<code>tina.extrude(n)</code>	
<code>tina.goto(x,y)</code>	

When should the `goto` command be used? Why should it be used only when necessary?


List the steps needed to save and publish a design.


About tangrams (Section 1.8: Art Project)

The tangram consists of seven pieces as described below:

Choosing a unit of measurement so that the seven pieces can be assembled to form a square of side one unit and having area one square unit, the seven pieces are:

- 2 large right triangles (hypotenuse 1, sides  $\sqrt{2}/2$ , area  $1/4$ )
- 1 medium right triangle (hypotenuse  $\sqrt{2}/2$ , sides  $1/2$ , area  $1/8$ )
- 2 small right triangles (hypotenuse  $1/2$ , sides  $\sqrt{2}/4$ , area  $1/16$ )
- 1 square (sides  $\sqrt{2}/4$ , area  $1/8$ )
- 1 parallelogram (sides of  $1/2$  and  $\sqrt{2}/4$ , area  $1/8$ )

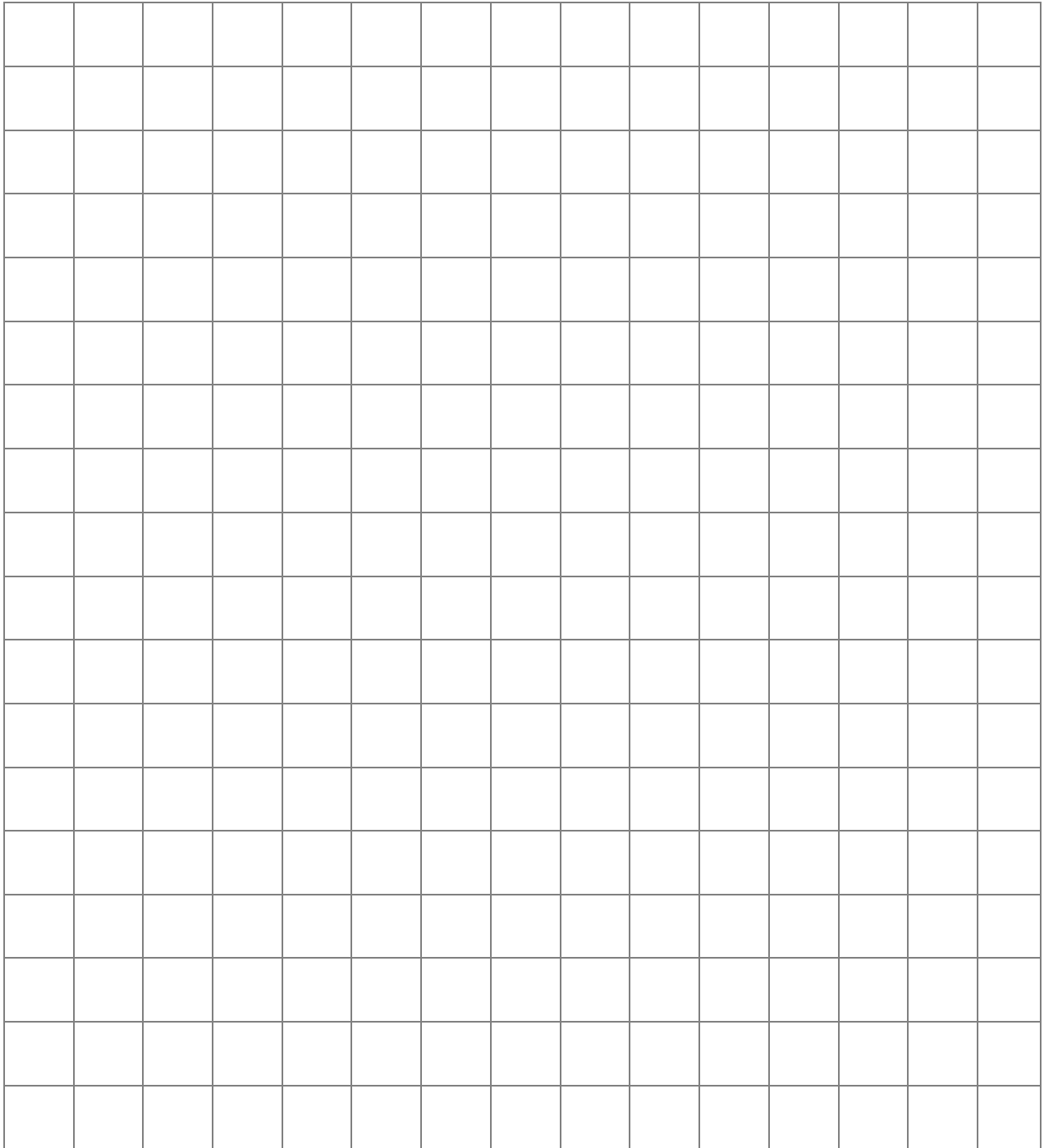


Try setting the hypotenuse of large triangle as 40 units.

## SECTION 1: TANGRAM ART PROJECT

### DESIGNING THE ART PROJECT

Draw the design.











## SECTION 2: LOOPS 1

In Section 2, learn how to use For loops to repeat a set of commands.

In the following example, explain what each line is telling the computer to do:

The command line...	means
<code>For i in range(4):</code>	
<code>tina.go(50)</code>	
<code>tina.left(90)</code>	
What will the drawing look like?	
What would you change to make an equilateral triangle?	

What two commands are used for all of the figures in Section 2?
How do you decide what angle to turn?
What happens if you change the number of times i is repeated (the range)?
What happens if you change the angle slightly?

Create an input/output table of values used to create polygons.

Number of sides (n)	Turn angle ( $360/n$ )	Resulting Polygon
		Triangle
	90	
5		
	60	Hexagon
8		
	30	
		"Circle"

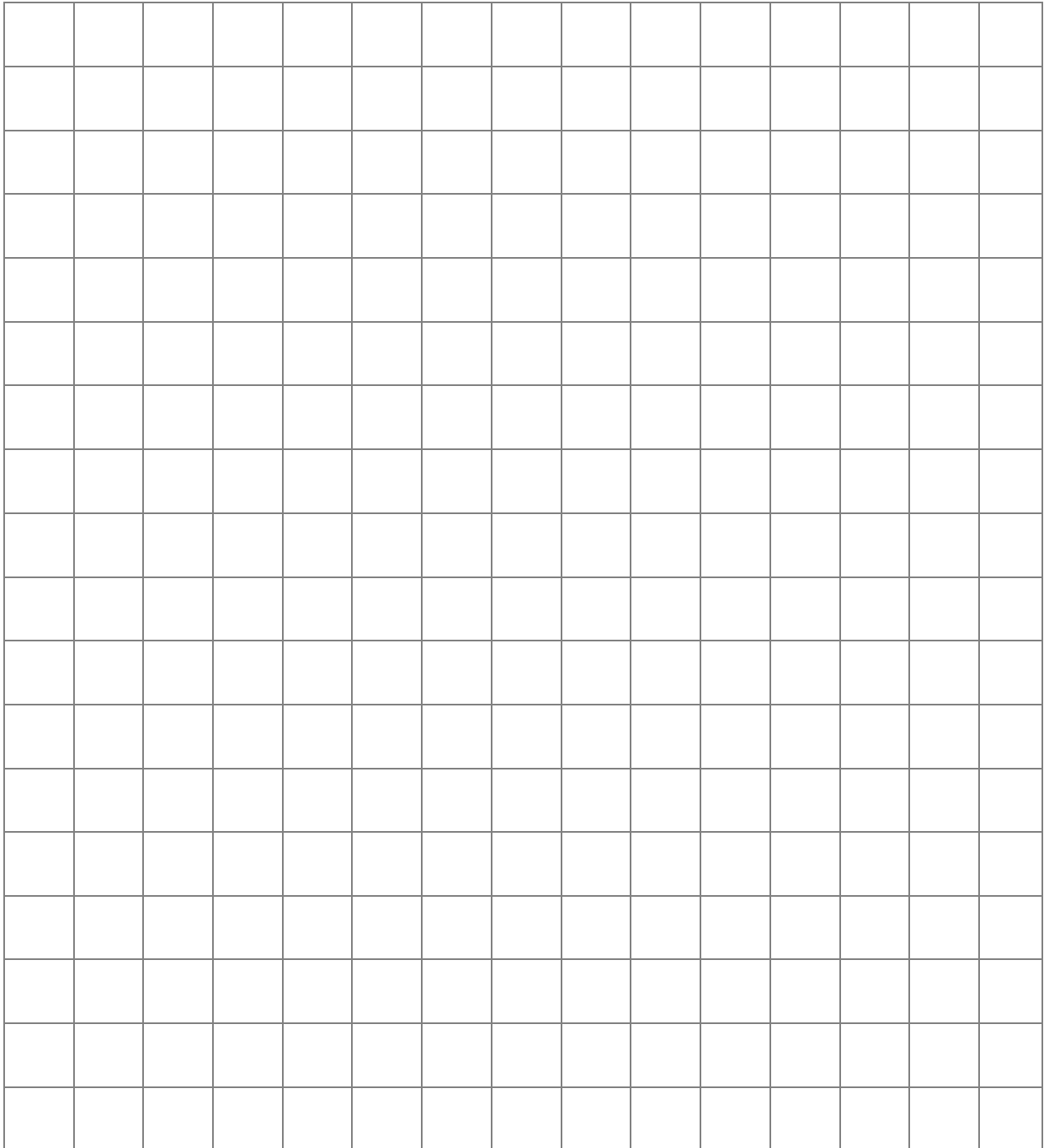
How does the star polygon relate to a regular pentagon?


Did you experiment with any other repeated patterns? What did you learn?


## SECTION 2: PENDANT

### DESIGNING THE ART PROJECT

Draw the design.











**SECTION 3: LOOPS 2**

In Section 3, learn how to write loops to create more complex linear and rotated patterns.

Vocabulary Review: Match the term with the correct definition.

- |                      |   |
|----------------------|---|
| ___ Algorithm        | A. an algorithm written using a programming language              |
| ___ Logical Error    | B. the way a command line is written                              |
| ___ Computer Program | C. a series of logical steps that leads to the solution of a task |
| ___ Syntax           | D. a mistake in an algorithm                                      |
| ___ Syntax Error     | E. a mistake in spelling, operators, indentations, spaces         |

Use the following questions to reflect on your progress as a computer programmer.

**Level 3.2** There are a number of ways to turn Tina as she is drawing the sawtooth. Compare your solution with other students. Did they end up with Tina in the same orientation? Which solution is the most elegant (simple, effective and easy to understand)?

**Level 3.3** Why do you think you start with Tina going 20 steps before beginning the loop?

**Level 3.4** It is easy to make mistakes in this program. If you make a mistake, what did you learn from it? What pattern resulted from the mistake?

**Level 3.6** Describe your program in words. Imagine that you are teaching a new student how to write a program. Can you explain how you go about planning and writing code?

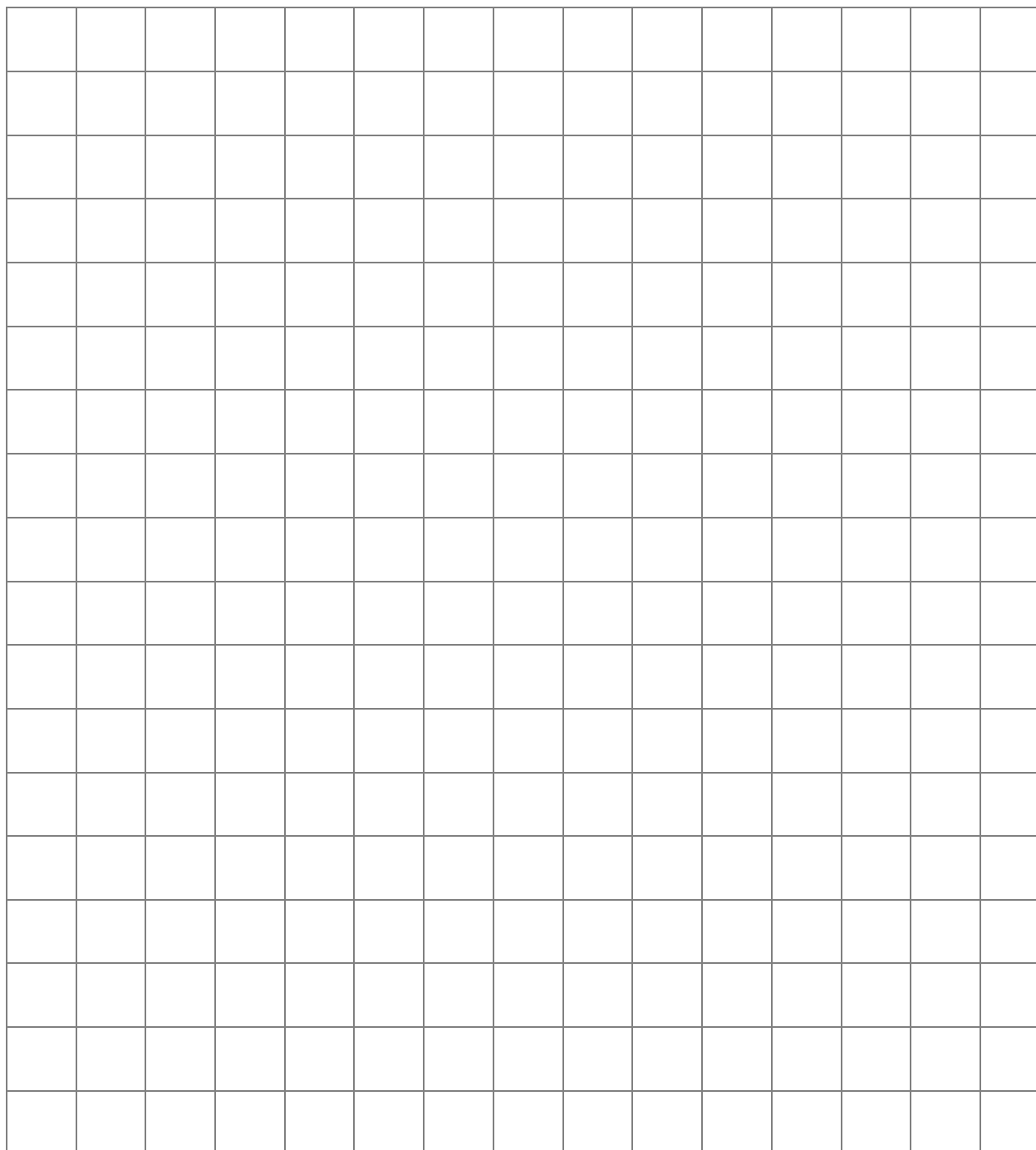
**Level 3.7** Why do you use the `goto` command in this level?

**End of Section 3** What are some benefits of writing loops?

### SECTION 3: REPEATED PATTERNS

#### DESIGNING THE ART PROJECT

Draw the design.









## SECTION 4: NESTED LOOPS

In Section 4, learn how to write nested loops (loops within loops).

Designers often collect patterns as a reference library.

Collect photographs or drawings of patterns within patterns, for example: lace, chains, tessellations, fabric and knits, beadwork, shells, gears. Paste them in these boxes.







Level 4.6 Math Challenge:

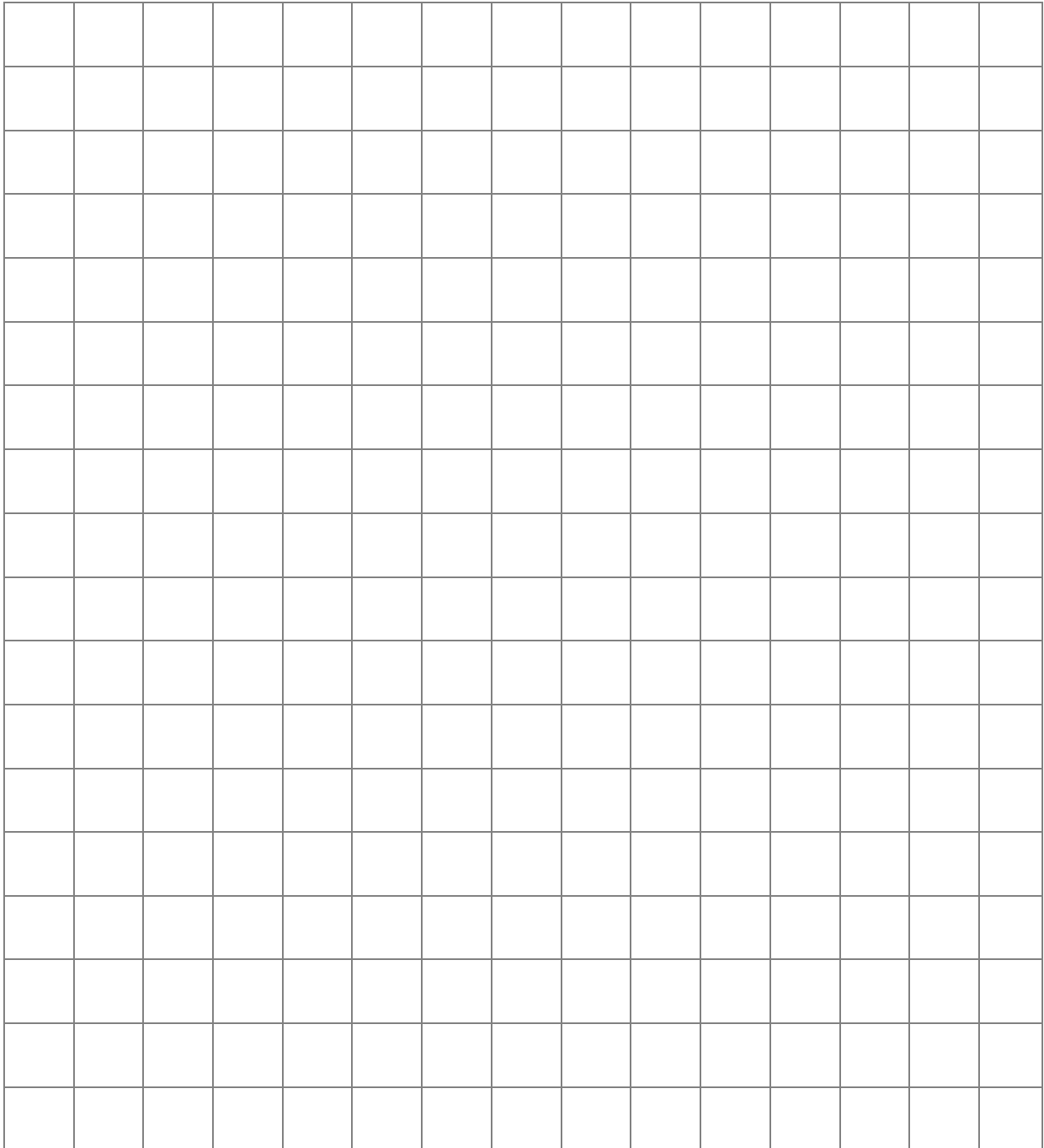
In Level 4.6, the angles used in the design are 90, 165 and 75 degrees. How are the angles 165 and 75 derived?

Reflection: What is the main difference between the code for the mosaic and code for the gear?

## SECTION 4: NESTED LOOP ART PROJECT

### DESIGNING THE ART PROJECT

Draw the design.









## SECTION 5 VARIABLES

Learn to use variables in the For loop.

Instead of  $i$  being defined as one value, a fixed number of equal steps,  $i$  can now represent a range of values. These values can change the outcome of each repetition of the loop. Any operation (addition, subtraction, multiplication, division) can be used to include  $i$  in the commands, creating interesting linear and non-linear designs.

Use the word list to complete these definitions of **variable** and **range**.

variable	counting	upper	output	difference	body	value
memory	For loop	lower	0	10		

**Variable:** in terms of programming, \_\_\_\_\_ is the name and \_\_\_\_\_ of something that will be recorded in \_\_\_\_\_. In the \_\_\_\_\_, the  $i$  is an **index or** \_\_\_\_\_ **variable**. If we set  $i$  to a range of values, then  $i$  will change each time the loop starts the \_\_\_\_\_ of the program. If we then use  $i$  as part of a command, that command will \_\_\_\_\_ a different value each time.

**Range:** the range is the lower and upper limit of the variable  $i$ . Note that if the range is set with only one value, then the \_\_\_\_\_ limit of the range is assumed to be \_\_\_\_\_, with the number in the parentheses being the \_\_\_\_\_ limit. Important: the final value will be the \_\_\_\_\_ between the upper and lower limit. For example, in range (1,11), the final value used in the program is \_\_\_\_\_, or 11-1.

New Command `angle ()`

Definition:

You may find the math challenging in this section.

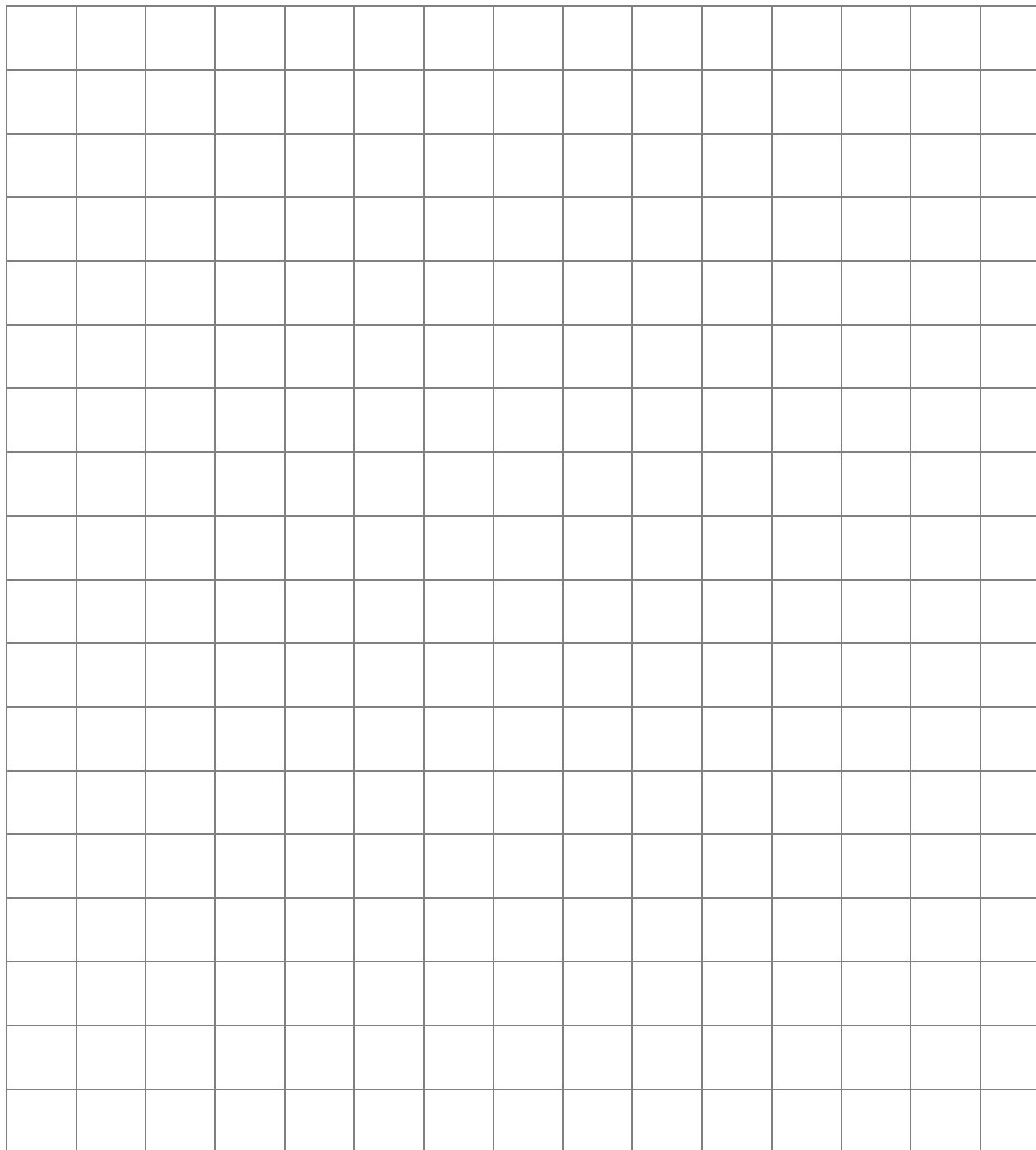
Write down your successes, challenges and questions for each level.

Successes	Challenges	Questions
Level 5.1		
Level 5.2		
Level 5.3		
Level 5.4		
Level 5.5		

## SECTION 5: DESIGN WITH VARIABLES ART PROJECT

### DESIGNING THE ART PROJECT

Draw the design.







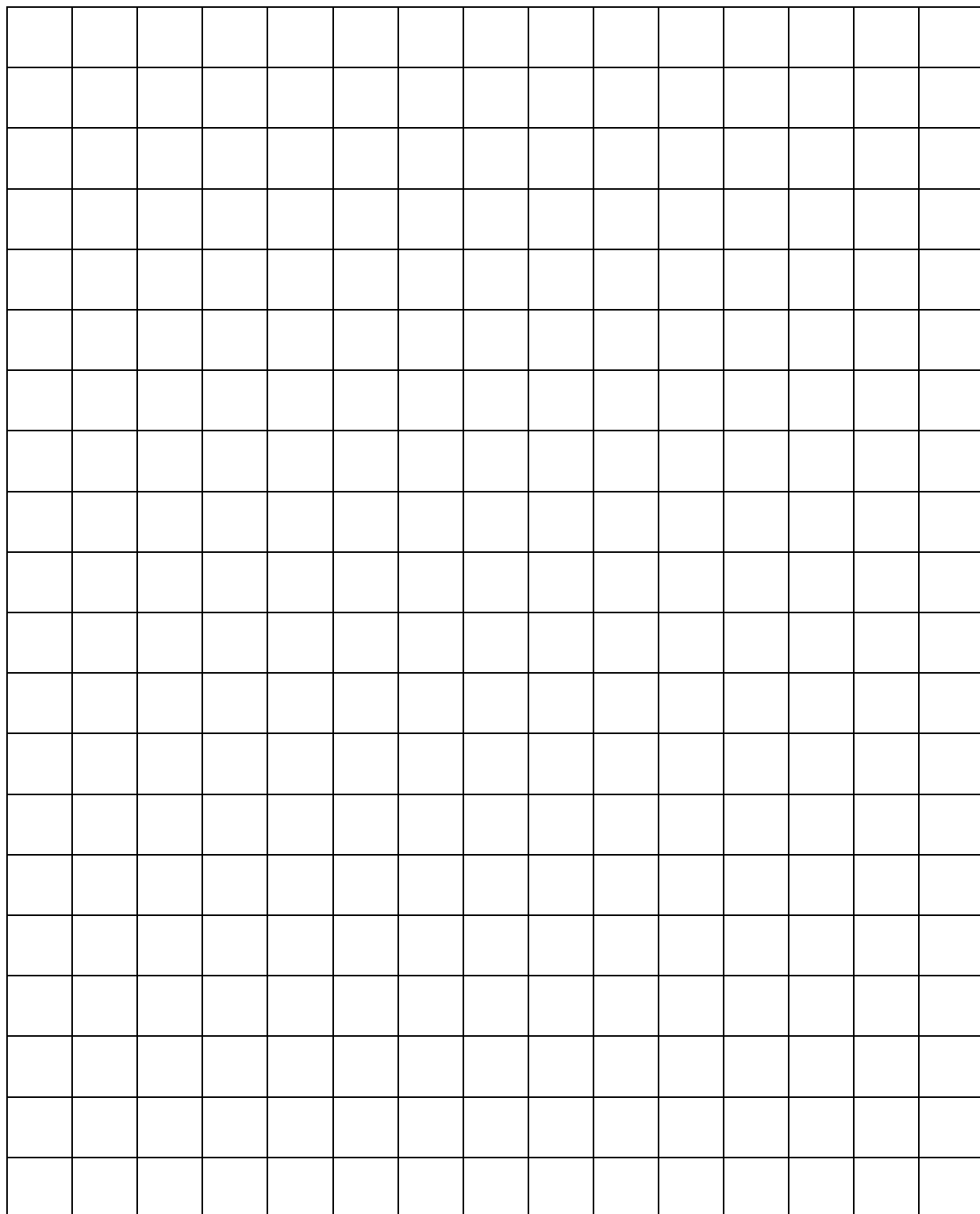




## DESIGNER LOG - DESIGNS I HAVE CREATED

File Name	Date created	Description

The following grid page can be used for your designs. Make a clear plastic overlay to use on the grid, or make copies for sketching and designing when you don't have a computer handy.



## NOTES