

Use *complete sentences* to answer the questions.

1. Using `netbeans` and your `RosePoem` project from Lab 1, modify the program as indicated below, answer the question (noting the **error message** produced, if any, by hovering the mouse over the red dot), then undo any change you made before proceeding. The idea here is to become aware of how `netbeans` reacts to various syntax problems.
  - (a) What happens if you (try to) put a blank line before each comment line in the header comments?
  - (b) Remove one of the slashes from one of the comment lines. What error message do you get?
  - (c) Try putting a comment within a comment, so that a `/* — */` pair appears within the header comments. What error message do you get?
  - (d) Delete the semicolon (`;`) from the end of the first `import` statement. What error message do you get?
  - (e) Delete a semicolon from a statement in the `run()` method. What error message does this cause?
  - (f) What happens when you change the line `public class RosePoem extends GraphicsProgram` to:  
`public class Poetry extends GraphicsProgram`
2. In Java, how do you specify the object to which a message is directed?
3. What is the difference between a syntax error and a bug (semantic error)?
4. Why is it important to apply good software engineering principles when you write your programs?
5. How does the position of the top, left corner of the `GRect` composing the face of the robot impact the other coordinates (of the eyes, nose, etc.)? I.e., if you set up all the coordinates with the face flush with the origin, how will they change when we reposition the face?

6. The exterior of my house is approximately 40 feet wide by 60 feet long. The walls are about 10 feet tall. In addition, the roof peaks symmetrically on either (40 foot wide) end, to a *total* height of 20 feet (the wall height plus another 10 feet to the peak of the roof). I want to paint the exterior of my house, including the upper triangles at each end, but need an estimate of the total area of the exterior.
- What are you being asked to find (problem statement)?
  - Draw a useful sketch of the house and indicate measurements:
  - What information is needed to find the answer (input data)?
  - What process or formulas can you use to get from the input to an answer (algorithm)?
  - If you have enough information to find the answer (output), give one; otherwise, explain:
7. A gallon of paint will cover approximately 350 square feet. How many gallons will it take to give my house (as described above) one coat of paint?
- What are you being asked to find (problem statement)?
  - What information is needed to find the answer (input data)?
  - What process or formula can you use to get from the input to an answer (algorithm)?
  - If you have enough information to find the answer (output), give one; otherwise, explain:
8. I want to model the *floorplan* (width and length, but not height) of my house (as described above) in a graphics window that is  $700 \times 550$  pixels, using a ratio of 10 pixels per foot. I want the long side of the house oriented left to right, while the shorter side will be oriented top to bottom in the window. I need to know how many pixels from the left and top sides of the window I need to start the outline (the upper-left corner) in order to **center** the floorplan rectangle in the window.
- What are you being asked to find (problem statement)?
  - What information is needed to find the answer (input data)?
  - What process or formula can you use to get from the input to an answer (algorithm)?
  - If you have enough information to find the answer (output), give one; otherwise, explain what is missing that you need.

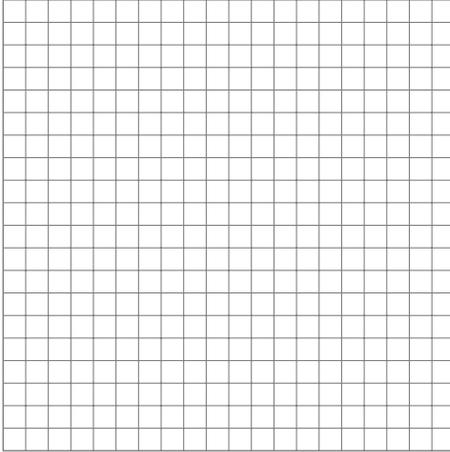
## Determine Coordinates, Widths, Heights, etc. for Exercises 1 – 3 in Lab 2

**Recall:** the origin is in the upper left corner, and Y values increase as you move down the window.

Sketch the target, line house, and rainbow in each of the provided grids, flush to the top left corner. In the second grid (for the target and house), move the figure away from the top left corner. Then, for each exercise, construct a table of values which shows the placement and size of each object used to create the final picture. Use each square as a single unit, then multiply by 20 for the number of pixels.

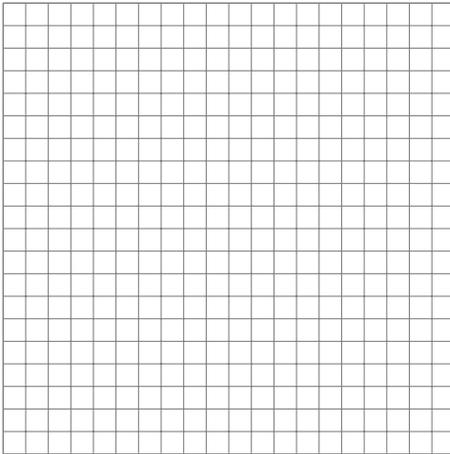
### 9. Exercise 1: Target

(a) Target — flush to top left corner



	$x$	$y$	$w$	$h$
Outer circle				
Middle circle				
Center circle				

(b) Target — moved right 3 units and down 3 units



$$\Delta x =$$

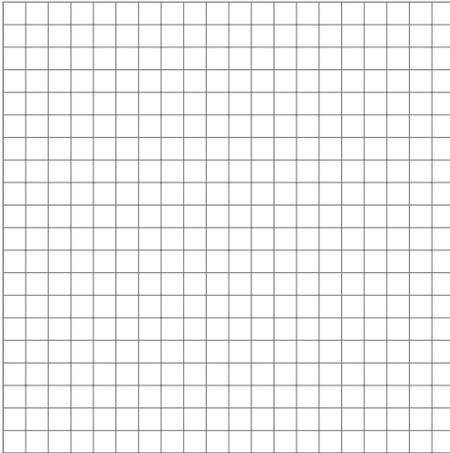
$$\Delta y =$$

translated	$x$	$y$	$w$	$h$
Outer circle				
Middle circle				
Center circle				

scaled by 20	$x$	$y$	$w$	$h$	filled?	color name
Outer GOval						
Middle GOval						
Center GOval						

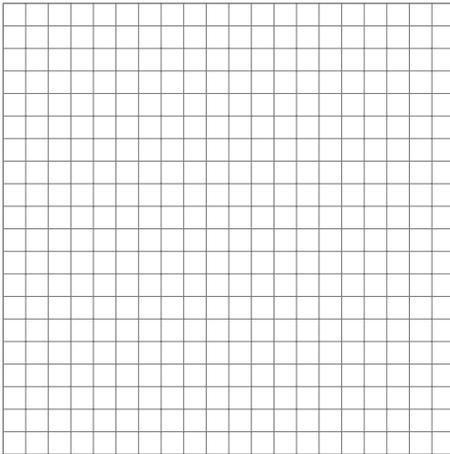
## 10. Exercise 2: Line House (incomplete — not all lines given in tables below)

(a) Line house - flush to top left corner



	$x$	$y$
Left wall: Upper		
Left wall: Lower		
Roof peak		
Right wall: Upper		
Right wall: Lower		

(b) Line House - moved right 5 units and down 3 units



$\Delta x =$

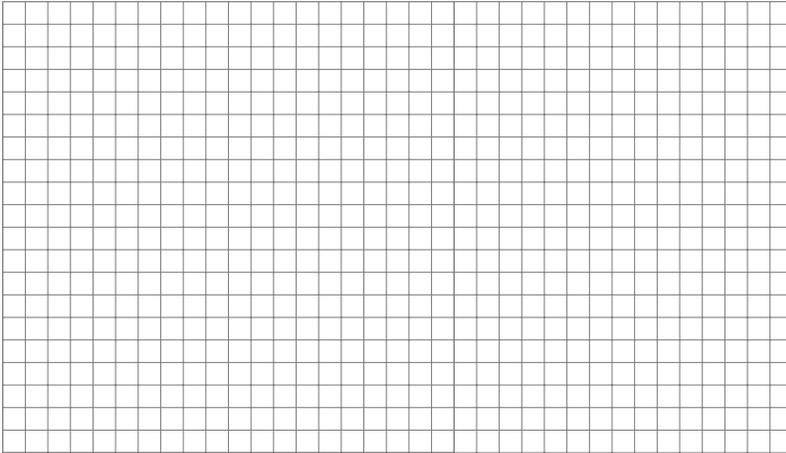
$\Delta y =$

	$x$	$y$
Left wall: Upper		
Left wall: Lower		
Roof peak		
Right wall: Upper		
Right wall: Lower		

Scaled by 20	$x_1$	$y_1$	$x_2$	$y_2$
Left Wall GLine				
Right Wall GLine				
Roofline GLine				
Baseline GLine				
Door Upper				
Door Left				
Door Right				
Left window: Left side				
Left window: Right side				
Left window: Upper				
Left window: Lower				

11. Exercise 3: Rainbow (7 circles, lower half –below window– covered by rectangle). You may want to sketch as nested rectangles for simplicity.

(a) Rainbow - flush to top left corner



	$x$	$y$	$w$	$h$
Red circle				
Orange circle				
Yellow circle				
Green circle				
Blue circle				
Magenta circle				
White circle				
White rectangle				

Down 5, scale by 20	$x$	$y$	$w$	$h$	filled?	color name
Red GOval						
Orange GOval						
Yellow GOval						
Green GOval						
Blue GOval						
Magenta GOval						
White GOval						
White GRect						