

1. Search online for lyrics to a song by Harry Chapin (December 7, 1942 – July 16, 1981) concerning 30,000 pounds of bananas, read them, then describe **what malfunction of the truck** caused it to crash. (The song is based on an actual truck accident which occurred in Scranton, Pennsylvania in 1965.)

2. We desire a loop to "Count by sevens starting at 0 until the number has *more than three digits*."

(a) Give an appropriate **for** loop header to achieve this:

(b) Give the necessary statements to make an equivalent **while** loop:

i. **initialization:**

ii. **while header:**

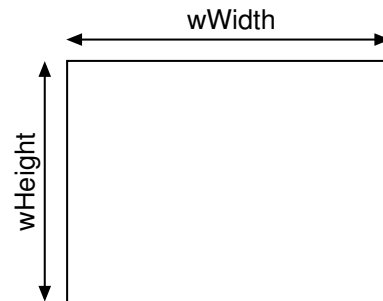
iii. **update:**

3. Exercises 1 through 3 in lab 5 require a centered background rectangle which is 80% of the width and height of the graphics window.

(a) In the graphics window at right, draw a background rectangle about 80% of the window's width and height, centering it. Mark the **position** of the rectangle with a *. What size are the left and top margins?

left margin is:

top margin is:



(b) Complete the code fragment below to determine the background's width and height and display it centered in the window.

```
double wWidth = getWidth();    // get the window's width
double wHeight = getHeight(); // get the window's height
// Calculate background rectangle's width and height
double backWidth =

double backHeight =

// Determine position of background rectangle (centered in window)
double backX =

double backY =

// Create and display a blue background rectangle
GRect background = new GRect(

background.setFilled(true);
background.setColor(
add(background);
```

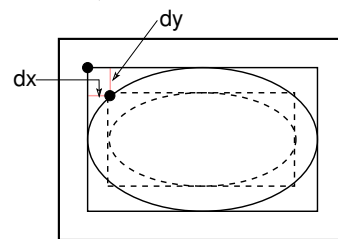
4. In the two-tone triangle problem in Lab 5, what boolean expression can be used to determine the color of the current block?

5. In the nested ovals problem in Lab 5, the next concentric oval is to shrink in width and height by **step**, which is to be set to **6% of the smaller of the width or height of the background rectangle**. In the box at right below, complete the following Java code fragment to determine the value of **step**:

```
double wWidth = getWidth();
double wHeight = getHeight();
double step;
```

6. In the nested ovals problem in Lab 5, the next concentric oval is to shrink in width and height by **step** (6% of the smaller of the width or height of the background rectangle).

(a) Using the picture at right as a guide, if the width and height of each oval changes by **step**, what are the values of dx and dy , the *change in position* of the next smaller oval?

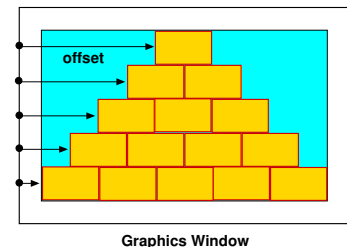


```
double dx =
```

```
double dy =
```

(b) What **boolean expression** can be used to exit the loop drawing the nested ovals?

7. In the pyramid problem in Lab 5, suppose you use a variable, **offset**, to keep track of the beginning x of each row of blocks, and that you are building the pyramid from the top down. Further, assume that **wWidth**, **wHeight**, **bWidth**, and **bHeight** (window and block's widths and heights) have all been declared and properly initialized.



(a) The initial value of **offset** should be such that when used as the x-value for a block, the block is centered in the window. Determine the initial value of **offset**:

```
double offset =
```

(b) At the end of each row, in preparation for the next row, the **offset** should be modified. By how much and in what way?

8.(a) In the checkerboard program, what **expression** was used to switch between a square being filled (black) or not filled (white)?

(b) How could that expression be modified to choose between **four** colors instead of two?