Announcements

- Read for next time Chap. 7.1-7.2, 8.1-8.4
  - Loops – while/for
  - Arrays, ArrayList
- Reading Quiz for next time

Chapter 4.1-4.5 – Data Types

- Eight primitive types!
  - We’ll mostly use int, double, char, boolean
- Convert int to double
  
  ```
  int min = 4;
  double dmin = min * 1.0;
  ```

- Convert double to int
  
  ```
  double dmin = 4.2;
  int min = (int) dmin;  // truncates
  ```

Constants

- Constants in a class
  
  ```
  private static final RADIUS = 30.0;
  ```

  - Private – only accessible in the class
  - Static – belongs to the class
  - Final – cannot change its value

Math Functions

- Math.floor(4.2) is
- Math.ceil(4.2) is
- Math.max(5.3, 6.2) is
- Math.min(3, 8) is

Classwork Today - Animation

- Canvas

Canvas Details

- What are the dimensions of the Canvas?
  - java.awt.Dimension
- Creating the Canvas
  
  ```java
  final java.awt.Dimension SIZE =
  new java.awt.Dimension(600,600);
  Canvas display = new Canvas(SIZE);
  ```
- Accessing the dimensions
  
  ```java
  int height = SIZE.height;
  int width = SIZE.width;
  ```

Paint a circle

- Center of the screen
  - Point (x, y)
  - java.awt.point
    Point center =
    new Point(?, ?);
- Pen
  - Set the color
    Java.awt.Color.RED
  - Fill the oval
**Paint a Circle (cont)**

- Canvas has a special method
  - `paintComponent`
  - (must spell it exactly this way)
  - This method is automatically invoked when an event occurs
    - When main sets `isVisible` to true
    - When a window is resized

**Classwork today**

- Modify the Canvas class to get the circle to move
- Modify the Canvas class to get the circle to bounce inside the canvas
- Add a new class Bouncer to create a circle that bounces
- Create two bouncing circles