Announcements

• Read for next time Chap. 10.1-4
  – Inheritance
• Reading Quiz for next time
• Assignment 4 is out
Chapter 4.1- 4.5 – Data Types

• Eight primitive types!
  – We’ll mostly use int, double, char, boolean

• Convert int to double
  
  ```java
  int min = 4;
  double dmin = min * 1.0;
  ```

• Convert double to int
  
  ```java
  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

Diagram:
- Origin: (0,0)
- X-axis: x increases
- Y-axis: y increases
- Height
- Width
Canvas Details

• What are the dimensions of the Canvas?
  – java.awt.Dimension

• Creating the Canvas

  final java.awt.Dimension SIZE =
    new java.awt.Dimension(600,600);
  Canvas display = new Canvas(SIZE);

• Accessing the dimensions

  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