Name: *(as it would appear on official course roster)*		
Umail address:	**@umail.ucsb.edu**	section 4, 5, or 6
Optional: name you wish to be called if different from name above.		
Optional: name of "homework buddy" (leaving this blank signifies "I worked alone"		

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You may collaborate on this homework with AT MOST one person, an optional "homework buddy".

H06: Due Thursday, 01.14 in Lab

H06

CS56 W16

Static vs. Non-Static methods, Autoboxing, Auto-unboxing, Final, Math class (HFJ Ch10)
Assigned: Thu 01.07 Total Points: 50

MAY ONLY BE TURNED IN IN THE LECTURE/LAB LISTED ABOVE AS THE DUE DATE,
OR IF APPLICABLE, SUBMITTED ON GRADESCOPE. There is NO MAKEUP for missed assignments;
in place of that, we drop the five lowest scores (if you have zeros, those are the five lowest scores.)

Reading Assignment: : HFJ:Chapter_10, plus reading notes on the wiki.

1. (5 pts) Fill in the homework header properly—this helps us keep the grading pipeline flowing so that you get credit for your work and get feedback more quickly.
   - writing **either 4, 5, or 6** to indicate your **discussion section (lab)** meeting time
   - entering BOTH your name AND your umail address EVERY time.

   Paper submissions: One sheet of 8.5x11 paper double sided, or two DISCONNECTED SHEETS with your name on EACH. Please: **NO STAPLES, NO PAPERCLIPS, NO TAPE, NO ATTACHMENT OF ANY KIND**. These damage the document scanner.

   Scanned submission: When submitting by PDF upload: scan your pages legibly and **SCAN IN THE CORRECT ORDER**. Page 1 first, then Page 2, in the correct orientation. Failure to scan properly may result in zero credit, meaning you "use up" one of your five "drop the lowest grade" slots.

2. (3 pts) What does final mean when applied to a static variable?

3. (3 pts) What does final mean when applied to a non-static variable?

4. (3 pts) What does final mean when applied to a method?

5. (3 pts) What does final mean when applied to a class?

6. Be sure you understand *precisely* the difference between auto boxing and auto unboxing before answering the following questions.

   a. (4 pts) Write a line (or two) of Java code that would result in auto-unboxing but NOT auto-boxing

   b. (4 pts) Write a line (or two) of Java code that would result in boxing but NOT auto-unboxing

7. Answer these questions about static vs. non-static methods. Note: When I ask for for a "use case" for something, I mean "describe the general set of circumstances when such a thing is useful." It is not sufficient in these cases to just cite a single specific instance. For example, don't say "the Math class is an example of such and such" and leave it at that. Say something like "the Math class is an example, because ... " and then describe what is true about the Math class that, if true of another class Foo, would also make it a good candidate for this situation.

   a. (3 pts) What is a "use case" for a class with all static methods? (See note above about "use case").

      a. (2 pts) In this use case (the one you just described), does it make sense to create an instance this class? Why or why not? (briefly explain).

   b. (3 pts) What is a "use case" for a class with all non-static methods?

      a. (2 pts) In this use case (the one you just described), does it make sense to create an instance this class? Why or why not? (briefly explain).

   c. (3 pts) What is a "use case" for a class with a mix of static and non-static methods?

      a. (2 pts) In this use case (the one you just described), does it make sense to create an instance this class? Why or why not? (briefly explain).

8. (10 pts) Write a class in Java with a main program equivalent to the following C program. (Hint: Use the Math and classes and formatting methods of the String class described in Chapter 10.)

```
#include <math.h>
#include <stdio.h>

int main()
{
 int i;
 for (i=0;i<=10;i++)
 {
    double value= sin((i/10.0) * (2 * M_PI));
    printf("i=%3d  value=%6.3lf\n", i, value);
 }
 return 0;
}
```