Feb 11, 10 7:23 **test_Circle.cpp** Page 1/1

```
//  file: test_Circle.cpp
//
//  This program calculates the area of a circle, given the radius.
//
//  Programmer:  Dick Furnstahl  furnstahl.1@osu.edu
//
//  Revision history:
//      05-Feb-2009  original version, for 780.20 Computational Physics
//      11-Feb-2010  added output statements
//
//  Notes:
//   * Use make_test_Circle to compile and link with the Circle class
//   * Compare to area.cpp from Session 1
//
//  To do:
//   * Test additional methods for the Circle class
//
//*************************************************************************//

// include files
#include <iostream>
using namespace std;  // otherwise preprend std:: to cin, cout, endl

#include "Circle.h"    // include the Circle class definition

//*************************************************************************//

int
main ()
{
  double my_radius;
  // Have to specify std namespace now with  before cout, cin, endl
  cout << "Enter the radius of a circle: ";                  // ask for radius
  cin >> my_radius;

  Circle my_first_circle(my_radius);  // create a Circle object

  double my_area = my_first_circle.area();
  cout << "radius = " << my_radius << ", area = " << my_area << endl;

  // Now create another circle in a block (i.e., between {}'s)
  {
    Circle my_second_circle(2.*my_radius);
    cout << "Made a 2nd circle of radius: "
         << my_second_circle.get_radius() << endl;
    cout << endl << "Last statement inside {}'s . . . " << endl;
  }
  cout << "Now outside {}'s. " << endl << endl;

  return (0);                     // successful completion
}

//*************************************************************************//
```

Feb 11, 10 7:26 **area.cpp** Page 1/1

```
//  file: area.cpp
//
//  This program calculates the area of a circle, given the radius.
//
//  Programmer:  Dick Furnstahl  furnstahl.1@osu.edu
//
//  Revision history:
//      02-Jan-2004  original version, for 780.20 Computational Physics
//      01-Jan-2010  updates to "To do" wishlist
//
//  Notes:
//   * compile with:  "g++ -o area area.cpp"
//
//  To do:
//   1. output the answer with higher precision (more digits)
//   2. use the "predefined" value of pi or atan
//   3. define an inline square function
//   4. split the calculation off into a function (subroutine)
//   5. output to a file (and/or input from a file)
//   6. rewrite using a Circle class
//
//*************************************************************************//

// include files
#include <iostream>      // this has the cout, cin definitions
using namespace std;     // if omitted, then need std::cout, std::cin

//*************************************************************************//

const double pi = 3.1415926535897932385;   // define pi as a constant

int
main ()
{
  double radius;    // every variable is declared as int or double or ...

  cout << "Enter the radius of a circle: ";                  // ask for radius
  cin >> radius;

  double area = pi * radius * radius;   // area formula

  cout << "radius = " << radius << ", area = " << area;

  return 0;                        // "0" for successful completion
}

//*************************************************************************//
```

```
//  file: Circle.h
//
//  Header file for the Circle C++ class.
//
//  Programmer:  Dick Furnstahl  furnstahl.1@osu.edu
//
//  Revision history:
//      02/05/09  original version
//
//  Notes:
//   *
//
//  To do:
//   *
//
//*****************************************************************

// The ifndef/define macro ensures that the header is only included once
#ifndef CIRCLE_H
#define CIRCLE_H

// include files

class Circle
{
  public:
    Circle (const double rad);  // constructor
    ~Circle ();  // destructor

    // accessor functions
    double get_radius ();
    void set_radius (const double rad);
    double area ();

  private:
    double radius;  // the circle radius
    inline double sqr (const double x) {return x*x;};  // inline function
};

#endif
```



```
//  file: Circle.cpp
//
//  Definitions for the Circle C++ class.
//
//  Programmer:  Dick Furnstahl  furnstahl.1@osu.edu
//
//  Revision history:
//      02/05/09  Original version.
//
//*****************************************************************
// include files
#include "Circle.h"       // include the header for this class

//*****************************************************************

#include <iostream>

const double pi = 3.1415926535897932385;        // define pi

Circle::Circle (const double rad) // Constructor for Circle
{
  radius = rad;    // set the internal (private) radius to the passed value

  // For debugging, print a message when we make a circle
  std::cout << "A circle of radius " << radius
            << " is created ..." << std::endl;
}

Circle::~Circle () // Destructor for Circle (not much to do here!)
{
  // For debugging, print a message when we make a circle
  std::cout << "A circle of radius " << radius
            << " is destroyed ..." << std::endl;
}

void Circle::set_radius(const double rad)
{
  radius = rad;
}

double Circle::get_radius()
{
  return radius;
}

double Circle::area()
{
  return pi * sqr(radius);
}

//*****************************************************************
```