COURSE ASSIGNMENT

a) Write a class named Point2d. Point2d should contain two member variables of type double: m_x, and m_y, both private and defaulted to 0.0. Provide a constructor and a print function.
The following program should run and display the appropriate output:

```
int main()
{
    Point2d first(3,4);
    Point2d second;
    first.printPoint();
    second.printPoint();

    return 0;
}
```

b) Now add a member function named distanceTo that takes another Point2d as a parameter, and calculates the distance between them. Given two points (x1, y1) and (x2, y2), the distance between them can be calculated as sqrt((x1 - x2)*(x1 - x2) + (y1 - y2)*(y1 - y2)). The sqrt function lives in header cmath.
The following program should run and display the appropriate output:

```
int main()
{
    Point2d first(3,4);
    Point2d second;

    first.printPoint();
    second.printPoint();

    cout << "Distance between two points: " << first.distanceTo(second) << endl;

    return 0;
}
```

c) Change function distanceTo from a member function to a non-member friend function in a friend class that takes two Points as parameters. Also rename it "distanceFrom".
The following program should run and display the appropriate output:

```
int main()
{
    Point2d first(3,4);
    Point2d second;

    first.printPoint();
    second.printPoint();

    DistanceCalculator dc;

    cout << "Distance between two points: " << dc.distanceFrom(first, second) << endl;

    return 0;
}
```

d) Write another class named Point3d which inherits from class Point2d. It should contain an addition private member variable of type double: m_z defaulted to 0.0. Provide all the above functionalities for Point3d as well.