

```

//*****
//
// Sample Solution for pa5.cc -- Fall 2005
//
//*****
#include <iostream>
#include <iomanip>
#include <string>
#include <cmath>
using namespace std;

const double LBS_TO_KG = 0.45;
const double MI_TO_KM = 1.61;

int main()
{
    int choice;
    double x1,y1,x2,y2,slope;
    double x,y;
    double side1,side2,hypotenuse;
    double pounds,kilograms;
    double miles,kilometers;

    cout << fixed << showpoint;
    cout.precision(3);

    do
    {
        cout << endl;
        cout << "1. Calculate Slope\n";
        cout << "2. Identify Quadrant\n";
        cout << "3. Calculate Hypotenuse\n";
        cout << "4. Convert Pounds to Kilograms\n";
        cout << "5. Convert Miles to Kilometers\n";
        cout << "6. Quit\n\n";

        cout << "Selection: ";
        cin >> choice;

        switch(choice)
        {
            case 1: cout << "Enter x,y of first point: ";
                    cin >> x1 >> y1;
                    cout << "Enter x,y of second point: ";
                    cin >> x2 >> y2;

                    if (x2 - x1 != 0)
                    {
                        slope = (y2 - y1) / (x2 - x1);
                        cout << "slope through (" << x1 << "," << y1 << ") and ("
                            << x2 << "," << y2 << ") is " << slope << "\n\n";
                    }
                    else
                        cout << "slope through (" << x1 << "," << y1 << ") and ("
                            << x2 << "," << y2 << ") is undefined" << "\n\n";
                    break;
            case 2: cout << "Enter an x,y coordinate: ";
                    cin >> x >> y;

                    if (x == 0 && y == 0)
                        cout << "point (" << x << "," << y << ") is the origin\n\n";
        }
    }
}

```

```

else if (x > 0 && y > 0)
    cout << "point (" << x << ", " << y << ") is in "
        << "Quadrant I\n\n";
else if (x < 0 && y > 0)
    cout << "point (" << x << ", " << y << ") is in "
        << "Quadrant II\n\n";
else if (x < 0 && y < 0)
    cout << "point (" << x << ", " << y << ") is in "
        << "Quadrant III\n\n";
else if (x > 0 && y < 0)
    cout << "point (" << x << ", " << y << ") is in "
        << "Quadrant IV\n\n";
else if (x == 0 && y != 0)
    cout << "point (" << x << ", " << y << ") is on the y-axis\n\n";
else if (x != 0 && y == 0)
    cout << "point (" << x << ", " << y << ") is on the x-axis\n\n";
break;
case 3: cout << "Enter the length of sidel: ";
cin >> sidel;
cout << "Enter the length of side2: ";
cin >> side2;

if (sidel <= 0 || side2 <= 0)
    cout << "Invalid length -- both sides must be greater than"
        << " zero\n\n";
else
{
    hypotenuse = sqrt(sidel * sidel + side2 * side2);
    cout << "Hypotenuse = " << hypotenuse << endl << endl;
}
break;
case 4: cout << "Enter a weight in pounds: ";
cin >> pounds;

kilograms = pounds * LBS_TO_KG;
cout << pounds << " pounds is " << kilograms << " kilograms\n\n";
break;
case 5: cout << "Enter a distance in miles: ";
cin >> miles;

kilometers = miles * MI_TO_KM;
cout << miles << " miles is " << kilometers << " kilometers\n\n";
break;
case 6: cout << "Thank you for using the program ... Goodbye !!\n\n";
break;
default: cout << "Invalid Selection -- Please Try Again !\n\n";
break;
}

} while (choice != 6);

return 0;
}

```