Tutorial – Vectors, Part 2

1. Convert the following angles (in degrees) to Radians

   - 30
   - 45
   - 72

2. Convert the following angles (in radians) to degrees

   - 1.5
   - (3PI)/2
   - 2

3. Find the dot product of the following pairs of vectors. For each pair, list whether they are pointing in the same direction, opposite directions, or are perpendicular

   - (3, 4) and (-5 3)
   - (0, 8) and (8, 0)
   - (0, -3) and (0, -6)
   - (-1, -1) and (-5, -6)
   - (3, 3) and (3, -3)

4. Find the angles between each of the vectors listed above

5. Calculate the cross product of the following Vectors:

   - (-8, 0, -3) x (2, 2, 4)
   - (14, 5, -5) x (-2, 1, 43)
   - (0.45, 0.2, -0.69) x (0, 1.0, 0)

6. Prove that the vectors A(2.3, 4.1, -3.11) and B(79.49, -78.37, -44.54) are perpendicular to each other

7. During the tutorial for Vectors - Part 1, you created the following Vector structure

```
struct Vector
{
      float x;
      float y;
      float z;
};
```

Extend on the work you did last session by adding the following functions:

a. float Dot(Vector a_first, Vector a_second)

b. Point Cross(Vector a_first, Vector a_second)

c. Point Angle(Vector a_first, Vector a_second)

- Finds the Euler angle between two vectors

8. Confirm that the functions you wrote for Question 7 are correct by writing test cases. You can use the answers from the other questions as your test data.

Recommended Reading:

http://www.wildbunny.co.uk/blog/vector-maths-a-primer-for-games-programmers/vector/