Exercise – Dot and Cross Product

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

* 30
* 45
* 72

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

* 1.5
* (3PI)/2
* 2

1. 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)

1. Find the angles between each of the vectors listed above
2. 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 )

1. Prove that the vectors A(2.3, 4.1, -3.11) and B(79.49, -78.37, -44.54) are perpendicular to each other
2. 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:

* 1. float Dot(Vector a\_first, Vector a\_second)
  2. Point Cross(Vector a\_first, Vector a\_second)
  3. Point Angle(Vector a\_first, Vector a\_second)
     + Finds the Euler angle between two vectors

1. 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/>