

Tutorial – Vectors, Part 1

1. Given the vectors $A = (2, 3)$ and $B = (-2, -4)$ find
 - a. $A + B$
 - b. $A - B$
 - c. The magnitude of A and B
 - d. $-2A + 3B$
2. Normalise the following vectors
 - a. $(3, 4)$
 - b. $(6, 9)$
 - c. $(25, 2)$
 - d. $(11.52, 53.34)$
3. A ball at position $(2, 1)$ is travelling at $(1, -2)$ units per second. After 5 seconds, where will it be?
4. Determine whether or not these two circles collide:
A - radius = 1.5, centre = $(3, 3)$
B - radius = 1.5, centre = $(5, 0)$

5. Given the following structure:

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

Create the following functions:

- a. `Vector Add(Vector a_first, Vector a_second)`
- b. `Vector Subtract(Vector a_first, Vector a_second)`

- c. Vector ScalarMultiply(Vector a_point, int a_iScalar)
 - d. Vector ScalarDivide(Vector a_point, int a_iScalar)
 - e. float Magnitude(Vector a_point)
 - f. Vector Normalise(Vector a_point)
6. Confirm that the functions you wrote for question 5 are correct by writing some test cases. You can use the answers you calculated for the other questions as your test data.

Challenge:

Take the functions you created in question 5 and make a class.