Exercises – Points and Vectors

1. Given the vectors A = (2,3) and B = (-2, -4) find the answers for the following:
   1. A + B = 0, -1
   2. A – B = 4, 7
   3. -2A + 3B = 2, 6
   4. A x 3.5 =7, 10.5
   5. B / 2.0 = -1, -2
2. Given the following structure:  
   Create and implement the following functions:

struct Vector3

{

float x;

float y;

float z;

};

* 1. Vector3 Translate(const Vector3& a\_first, const Vector3& a\_second)
  2. Vector3 Add(const Vector3& a\_first, const Vector3& a\_second)
  3. Vector3 Subtract(const Vector3& a\_first, const Vector3& a\_second)
  4. Vector3 Scale(const Vector3& a\_point, float a\_scalar)
  5. Vector3 Multiply(const Vector3& a\_point, float a\_scalar)
  6. Vector3 Divide(const Vector3& a\_point, float a\_scalar)

1. Confirm that the functions you wrote for question 5 are correct by writing some test cases.
2. Convert the **Vector3** struct into a class that implements the Add, Subtract, Multiply and Divide and overloaded operators
   1. Implement a **Vector2** class, including the same methods as the Vector3 class

Using AIE Bootstrap

Located on the AIE GitHub repository (<https://github.com/AcademyOfInteractiveEntertainment/aieBootstrap>) is a Visual Studio project called **aieBootstrap**. Download it and open the Solution.

Bootstrap is a solution that contains a static library project and two example projects. The Bootstrap library allows us to easily render simple graphical applications. The example projects demonstrate 2-D rendering and 3-D rendering.

Spend some time experimenting with the 2-D example, using your Vector2 class to draw shapes in different locations.