# Winter Exam 2015-2016

Question 1.

1. (i) Ship to Asteroid (8, -3, -7) – (5, 1, 5) = (3, -4, -12)

Sqrt(3\*3+(-4)\*(-4)+(-12)\*(-12) = sqrt(9 + 16 +144) = sqrt (169)= 13

(ii) Direction of Ship To Asteroid = (1/13) \* (3,-4,-12)

(iii)

Mag of (2,-2,-1) = sqrt(4 + 4 + 1) = 3 = (1/3)(2,-2,-1)

(3, -4, -12)\*(1/3)(2,-2,-1) = 1/3\*(3(2)+(-4)(-2)+(-12)(-1)) = (1/3)(6+8+12)= (1/3)(26) = 8.67>0 = yes

(iv) v = (3,-4,-12) u = (2,-2,-1) then

26 = 13 \* 3 \*Cos (angle)

(26/39) = cos (angle)

Angle = 48 > 45 No.

(i)

(ii) **Vector3 position, velocity, acceleration;**

**Float dt;**

**…**

**…**

**Velocity += acceleration \* Time.deltaTime;**

**Position += velocity \* \* Time.deltaTime**

(iii)

Just add to acceleration Vector

(iv)

For gravity

Acceleration += Vector3.Down \* 9.8f;

Wind resistance

Acceleration += -k\*velocity