Question #1

Given pc = (11,2), vc= (0,4), pt = (6,6), t = 0.5, vm = 10 and am = 24

a) Update 1

pt - pc = (6, 6) – (11, 2) = (-5,4)

pt – pc / |pt – pc| = (-0.78, 0.62)

v = (-7.8, 6.2)

p’c = (11,2) + (-7.8, 6.2)(0.5) = (7.1, 5.1)

Update 2

pt - pc = (-1.1, 0.9)

pt – pc / |pt – pc| = (-0.77, 0.63)

v = (-7.7, 6.3)

p’c = (7.1, 5.1) + (-7.7, 6.3)(0.5) = (3.25, 8.25)

Update 3

pt - pc = (2.75, -2.25)

pt – pc / |pt – pc| = (0.77, -0.63)

v = (7.7, -6.3)

p’c = (3.25, 8.25) + (7.7, -6.3)(0.5) = (7.1, 5.1)

Update 4

pt - pc = (-1.1, 0.9)

pt – pc / |pt – pc| = (-0.77, 0.63)

v = (-7.7, 6.3)

p’c = (7.1, 5.1) + (-7.7, 6.3)(0.5) = (3.25, 8.25)

Update 5

pt - pc = (2.75, -2.25)

pt – pc / |pt – pc| = (0.77, -0.63)

v = (7.7, -6.3)

p’c = (3.25, 8.25) + (7.7, -6.3)(0.5) = (7.1, 5.1)

b) Update 1

pc - pt = (5, -4)

pc – pt / |pc – pt| = (0.78, -0.62)

v = (7.8, -6.2)

p’c = (11, 2) + (7.2, -6.2)(0.5) = (15.1, -1.1)

Update 2

pc - pt = (9.1, -7.1)

pc – pt / |pc – pt| = (0.79, -0.62)

v = (7.9, -6.2)

p’c = (15.1, -1.1) + (7.9, -6.2)(0.5) = (19.05, -4.2)

Update 3

pc - pt = (13.05, -10.2)

pc – pt / |pc – pt| = (0.79, -0.62)

v = (7.9, -6.2)

p’c = (19.05, -4.2) + (7.9, -6.2)(0.5) = (23, -7.3)

Update 4

pc - pt = (17, -13.3)

pc – pt / |pc – pt| = (0.79, -0.62)

v = (7.9, -6.2)

p’c = (17, -13.3) + (7.9, -6.2)(0.5) = (26.95, -10.4)

Update 5

pc - pt = (20.95, -16.4) pc – pt / |pc – pt| = (0.79, -0.62) v = (7.9, -6.2)

p’c = (26.95 , -10.4) + (7.9, -6.2)(0.5) = (30.9, - 13.5)

c) Update 1

pt - pc = (6, 6) – (11, 2) = (-5,4) n = (-0.78, 0.62)

a = (-18.72, 14.88)

v = (0, 4) + (-18,72, 14.88)(0.5) = (-9.36, 11.44)

p’c = (11,2) + (-9.36, 11.44)(0.5) = (6.32, 7.72)

Update 2

pt - pc = (-0.32, -1.72)

n = (-0.18, -0.98)

a = (-4.32, -23.52) v = (-11.52, -0.32)

p’c = (0.56, 7.56)

Update 3

pt - pc = (5.41, -1.56)

n = (0.96, -0.28)

a = (23.04, -6.72)

v = (0.05, -3.68)

p’c = (0.59, 5.72)

Update 4

pt - pc = (5.41, 0.28)

n = (1, 0.05)

a = (24, 1.2)

v = (12.05, 0.88)

p’c = (6.62, 6.76)

Update 5

pt - pc = (-0.62, -0.16)

n = (-0.97, -0.25)

a = (-23.28, -6)

v = (0.41, -2.12)

p’c = (6.83, 5.1)

d) Kinematic: The character moves linearly towards the target. If the velocity is too high, the character will overshoot the target and will have to correct. However, because the velocity is still too high, the character will continue to overshoot the target over and over again.

Steering: The character attempts to move towards the target. If the acceleration is too high, the character will overshoot and have to turn around and go back towards the target.

Question #2

1. pc = [(21, 6) + (5, 11) + (28, 9)] / 3 = (18, 8.67) vc = [(3, 1) + (3, 3) + (6, 5)]/3 = (4, 3)

panchor = (18, 8.67) + (1)(4, 3) = (22, 11.67)

1. Character 1: Δpsi = (22, 18) – (18, 8.67) = (4, 9.33)

p’si = (22, 11.67) + (4, 9.33) = (26, 21)

Character 2: Δpsi = (-12, 4.33) p’si = (10,16)

Character 3: Δpsi = (11, 3.33)

p’si = (33, 15)

1. If killed before a) pc  = (13, 13.5) vc = (3, 2) panchor = (16, 15.5) Character 1: Δpsi = (-11, 4.5)

p’si = (5, 20)

Character 2: Δpsi = (-7, -0.5) p’si = (9, 15)

The anchor would move to (16, 15.5) and Characters 1 and 2 will take slot positions (5, 20) and (9, 15) respectively.

If Character 3 was killed before b) but after a), then nothing would change because panchor and pc were already calculated.