Closed book. No calculators are to be used for this quiz.

Quiz duration: 10 minutes

Name: Student ID: Signature:

a_A= 10 m/s2 a_B= 0 m/s2

V_A= 20 m/s V_B= 5 m/sec

A   B

X_A=6m X_B=36m

As shown in figure 1, two cars **A** and **B** move along the x –axis. **A** is travelling with a constant acceleration 10 m/sec2 and its initial velocity is 20 m/sec. The second car **B** is travelling with a constant speed of 5 m/sec. Pls note that their initial positions are also different.

1- At what time(s) do **A** and **B** have the same position?

2- Plot a graph of position (X) versus time (t) for each car.

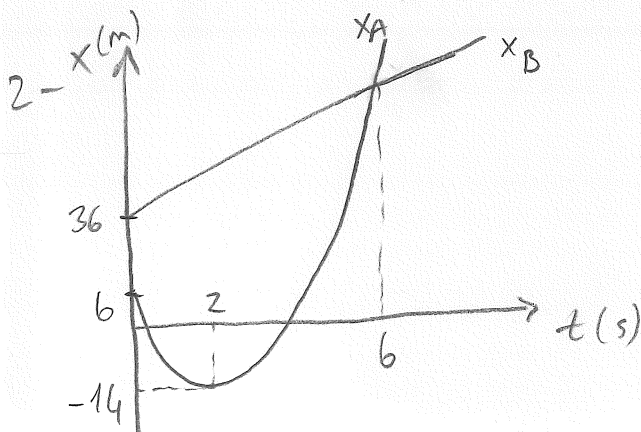1- $x_A = x_{A_0} + v_A t + \frac{1}{2} a_A t^2$ $x_B = x_{B_0} + v_B t$

at $t = T \Rightarrow x_A = x_B$

$x_{A_0} + v_A T + \frac{1}{2} a_A T^2 = x_{B_0} + v_B T \Rightarrow 5T^2 - 20T + 6 = 36 + 5T$

$5T^2 - 25T - 30 = 0$

$T^2 - 5T - 6 = 0$

$(T - 6)(T + 1) = 0 \Rightarrow \underline{T = 6s}$

2-

PHYS 101: General Physics 1

College of Arts and Sciences

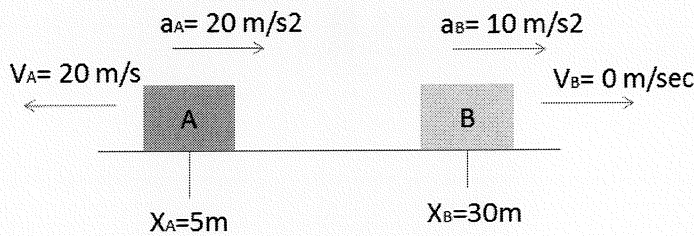Section   Quiz 2-2   February 2015

Closed book. No calculators are to be used for this quiz.

Quiz duration: 10 minutes

Name: Student ID: Signature:

a_A= 20 m/s2 a_B= 10 m/s2

V_A= 20 m/s V_B= 0 m/sec

| A | | B |

X_A=5m X_B=30m

As shown in figure1, two cars **A** and **B** move along the x –axis. **A** is travelling with a constant acceleration 20 m/sec2 and its initial velocity is 20 m/sec. The second car **B** is travelling with a constant acceleration of 10 m/sec. Pls note that their initial positions are also different.

1- At what time(s) do **A** and **B** have the same position?
2- Plot a graph of position (X) versus time (t) for each car.

1- $x_A = x_{A_0} + v_A t + \frac{1}{2} a_A t^2$ $x_B = x_{B_0} + \frac{1}{2} a_B t^2$

at $t = T \Rightarrow x_A = x_B$
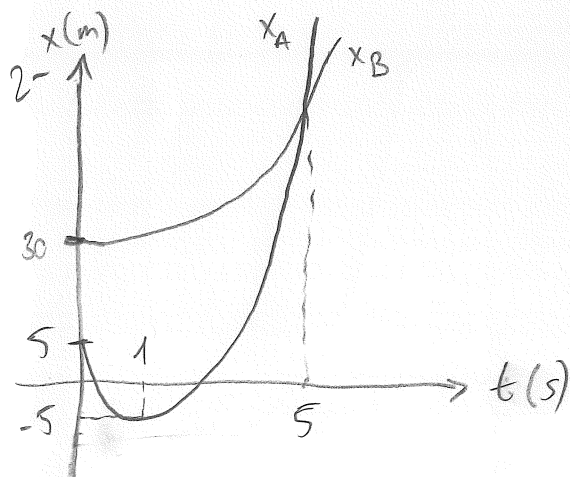
$x_{A_c} + v_A T + \frac{1}{2} a_A T^2 = x_{B_0} + \frac{1}{2} a_B T^2$

$5 - 20T + 10T^2 = 30 + 5T^2$

$5T^2 - 20T - 25 = 0$

$T^2 - 4T - 5 = 0$ $(T-5)(T+1) = 0$

$T = 5\ s$

2-

Closed book. No calculators are to be used for this quiz.

Quiz duration: 10 minutes

Name: **Student ID:**   **Signature:**

$a_A = 0$

$a_B = 10$ m/s2

$V_A = 5$ m/s

$V_B = 10$ m/sec

A   B

$X_A = 6$m $X_B = 26$m
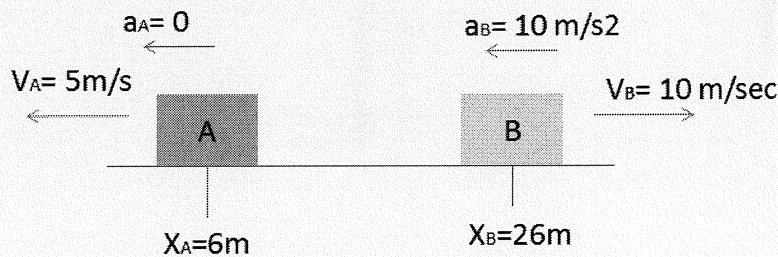
As shown in figure1, two cars **A** and **B** move along the x –axis. **A** is travelling with a constant velocity of 5 m/sec2. The second car **B** is travelling with a constant acceleration of 10 m/sec2 and its initial velocity is 10 m/sec. Pls note that their initial positions are also different.

1- At what time(s) do **A** and **B** have the same position?

2- Plot a graph of position (X) versus time (t) for each car.

$1- X_A = X_{A_0} + v_A t$

$X_B = X_{B_0} + v_B t + \frac{1}{2} a_B t^2$

at $t = T \Rightarrow X_A = X_B$

$X_{A_0} + v_A T = X_{B_0} + v_B T + \frac{1}{2} a_B T^2$

$6 - 5T = 26 + 10T + 5T^2$

$-5T^2 + 15T + 20 = 0$

$T^2 - 3T - 4 = 0$ $(T-4)(T+1) = 0$

$\underline{T = 4s}$

x(m)

2- 31 X_B

26

5   X_A

4

t(s)

-14