13 Key

Physics 11
Oct. 2009

Displacement - Time Relations

Name: _____
Block: _____

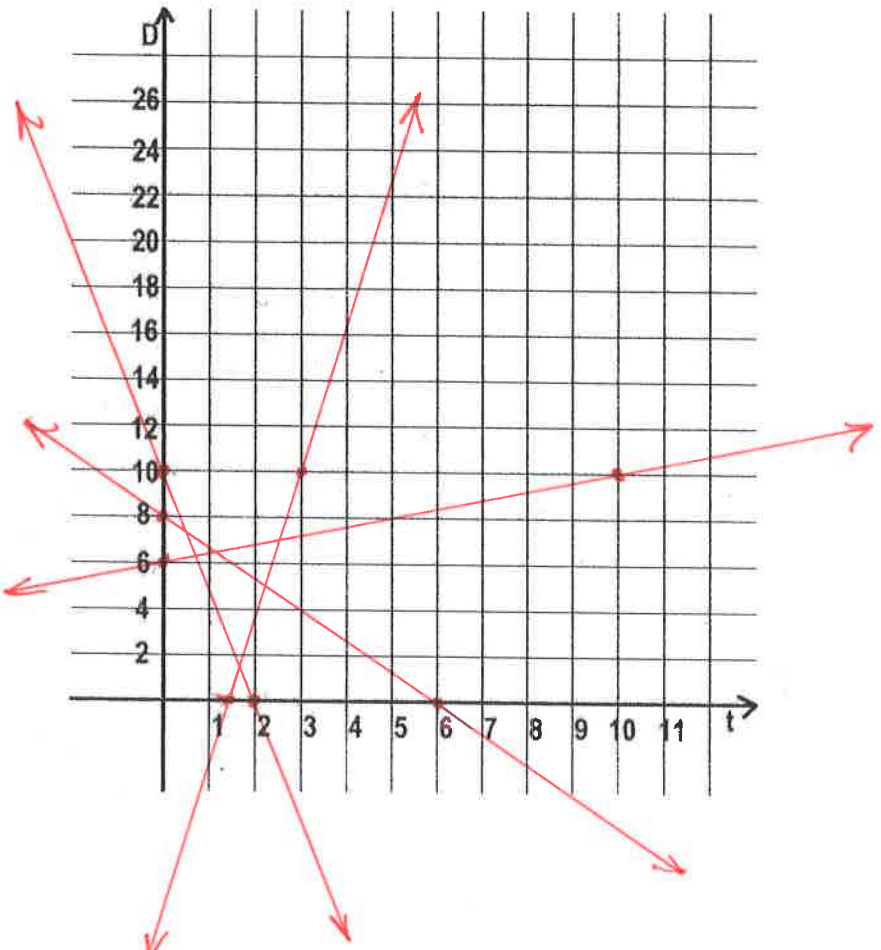
1. Plot the following equations on the graph:

a) $d = -5t + 10$

b) $d = \frac{-4}{3}t + 8$

c) $d = \frac{2}{5}t + 6$

d) $d = \frac{20}{3}t - 10$



(4)

2. Three runners are in a 3.0 km long cross-country race. Dan cheats by leading off by 4.0 m. Chris is distracted by all the girls in their revealing running shorts and doesn't start to run until 8.0 seconds after the starting gun sounds. Gavin doesn't cheat, and starts on time. Dan runs at 8.0 m/s, Chris runs at 9.0 m/s, and Gavin runs at 5.0 m/s.

Write equations of motion for each runner (ie, $d = v_0 t + d_0$)

DAN: $d = 8t + 4$

CHRIS: $d = 9(t - 8)$

GAVIN: $d = 5t$

(3)

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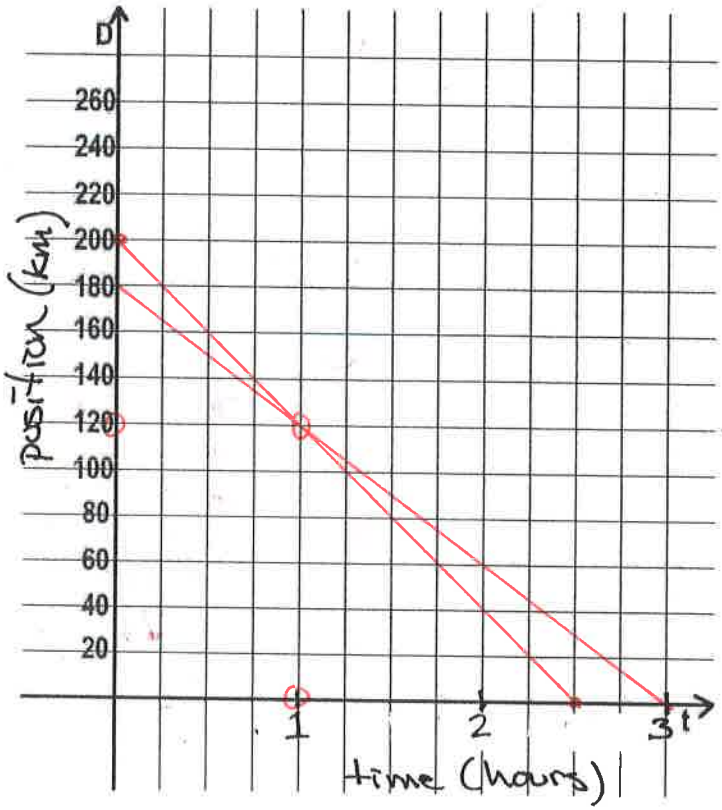
3. Dave and Steve are going to Las Vegas (with the company payroll). Dave starts from Dry Gulch, a small town 200 km west of Las Vegas. Steve starts from Dry Heave, another small town that is 180 km west of Las Vegas. Dave travels at a constant 80 km/h, and Steve travels at a constant 60 km/h. They both leave for Las Vegas at the same time.

a) Plot the motion of both Dave and Steve on the d-t graph.



(2)

b) Write equations of motion for both Dave and Steve.

$d_D = -80t + 200$

$d_S = -60t + 180$

(2)

c) Solve the two equations simultaneously to find when one person passes the other.

$-80t + 200 = -60t + 180$

$20 = 20t$

$1\text{ hr} = t$

(2)

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