Year 1 – Week 10 Exam Questions

Question	1	2	3	4	5	6	Total	
Marks								
Max Marks	7	8	9	7	7	6	44	%

Question 1

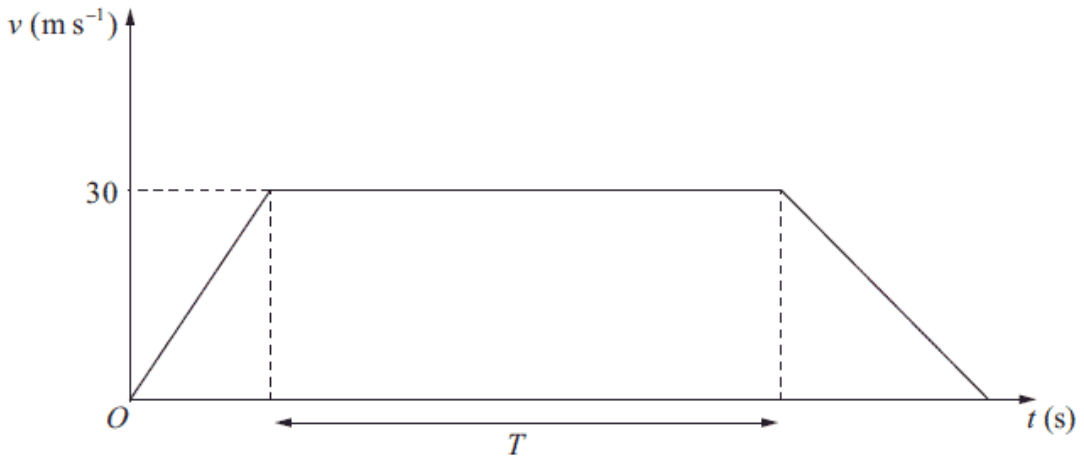

Figure 4

The velocity-time graph in Figure 4 represents the journey of a train P travelling along a straight horizontal track between two stations which are 1.5 km apart. The train P leaves the first station, accelerating uniformly from rest for 300 m until it reaches a speed of 30 m s^{-1}. The train then maintains this speed for T seconds before decelerating uniformly at 1.25 m s^{-2}, coming to rest at the next station.

(a) Find the acceleration of P during the first 300 m of its journey.

(2)

(b) Find the value of T.

(5)

Question 2

A particle P is projected vertically upwards from a point A with speed u m s^{-1}. The point A is 17.5 m above horizontal ground. The particle P moves freely under gravity until it reaches the ground with speed 28 m s^{-1}.

(a) Show that $u = 21$

(3)

At time t seconds after projection, P is 19 m above A.

(b) Find the possible values of t.

(5)

Question 3

Edexcel June 2013 Qu 4

A lorry is moving along a straight horizontal road with constant acceleration. The lorry passes a point A with speed u m s^{-1}, $(u < 34)$, and 10 seconds later passes a point B with speed 34 m s^{-1}. Given that $AB = 240$ m, find

(a) the value of u,

(3)

(b) the time taken for the lorry to move from A to the mid-point of AB.

(6)

Question 4

A car is moving along a straight horizontal road with constant acceleration. There are three points A, B and C, in that order, on the road, where $AB = 22\,\text{m}$ and $BC = 104\,\text{m}$.

The car takes $2\,\text{s}$ to travel from A to B and $4\,\text{s}$ to travel from B to C.

Find

(a) the acceleration of the car,

(b) the speed of the car at the instant it passes A.

[7 marks]

PURE MATHS

Question 5

The points A and B have coordinates $(6,1)$ and $(-2,7)$ respectively.

(a) Find the length of AB.

[2 marks]

(b) Find the gradient of the line AB.

[2 marks]

(c) Determine whether the line $4x - 3y - 10 = 0$ is perpendicular to AB.
Fully justify your answer.

[3 marks]

Question 6

In this question you must show detailed reasoning.

Determine for what values of k the graphs $y = 2x^2 - kx$ and $y = x^2 - k$ intersect.

[6 marks]