**Name**

**Graphs of Motion - Answer the questions below it, and show any calculations you made. Don’t freak out if you don’t get my exact answer – you should be within 10% or so of the right answer and that would be OK. (Answers on the back page)**

1. The position of a car is shown on the graph below. Answer the questions below it, and show any calculations you made. 

**This is a position question – you can just read the graph**

a) At what time does the car get to 160 m? 40 m? Where is the car at 8.0 seconds? 16.0 seconds? (Approximately)

**The next few questions are about velocity. Velocity is slope on this kind of graph.**

b) At what times is the velocity zero?

c) Where is the velocity the greatest? (The steepest slope) Use the slope of a tangent line to find the instantaneous velocity at that point.

d) Use tangent lines to find the instantaneous velocity at 4.0 and 18.0 seconds

**The next question is about acceleration. Acceleration is the concavity on this kind of graph.**

e) Where is the acceleration positive and where is the acceleration negative? Can you calculate the magnitude of the negative acceleration? (optional)

2. – This is a velocity vs. time graph for a different car.



**This is a velocity question – you can just read the graph.**

a) When is the velocity 12 m/s? What is the highest velocity it has? What is the velocity at 20.0 s?

**The next question is an acceleration question. Acceleration is the slope of a velocity graph.**

b) What is the acceleration at 3 seconds? at 6 seconds? at 12 seconds? at 25 seconds?

**These are displacement questions. Displacement is the area under this kind of graph.**

c) What is the displacement of the car between 5 and 10 seconds?

d) What is the displacement of the car between 0 and 5 seconds?

e) What is the displacement for the whole graph? (0-30 s)

Answers: (1a 10.s, 5s, 102 m, 294 m) (1b 0 and 20s) (1c 10 s, 32 m/s) (1d 13 m/s, 6.4 m/s) (1e 0-10s + accel, 10-20s - accel, -3.2 m/s/s)

(2a 5-10s and 18.6s, 16 m/s, 10.8 m/s) (2b 2.4 m/s/s, 0, 1 m/s/s, -0.875 m/s/s) (2c 60 m) (2d 30 m) (2e 290 m)