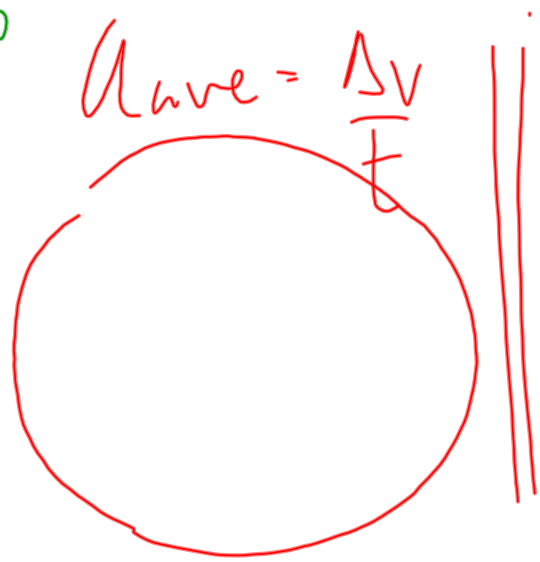Quiz: Today - Average Acceleration Problems

1. Understanding Concepts: Page 393 #2-6, 8, 11, 12   *HW*

2. Constant Acceleration - Special Case

3. Chapter 10 - Review
    Page 419 - Understanding Concepts #2, 4, 7, 9, 10, 14

    410

$$a_{ave} = \frac{\Delta v}{t}$$

$$a_{ave} = \frac{v_f - v_i}{t}$$

$$v_f = v_i + at$$

Understanding Concepts

1. How can you tell from a speed–time table whether an object is accelerating?

2. How can you tell from a speed–time graph whether an object is accelerating?

3. Sketch a speed–time graph with two separate labelled lines for

   (a) high positive acceleration;

   (b) low negative acceleration.

4. What feature of a speed–time graph communicates

   (a) the acceleration?

   (b) the distance travelled?

5. Two runners, Cathryn and Keir, take part in a fundraising marathon. The graph in **Figure 7** shows how their speeds change for the first 100 s from the start of the marathon.

Cathryn and Keir's Acceleration
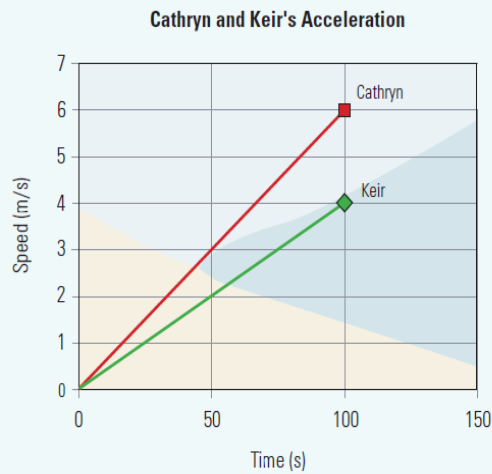
Figure 7

   (a) Which runner has the greater acceleration? Show this by calculating the acceleration of each.

   (b) Which runner is ahead after 100 s? Calculate and compare the distance travelled by each.

6. The cheetah is the fastest land animal and can accelerate rapidly in an attack. **Table 3** shows some typical speeds and times for a cheetah.

   (a) Draw a speed–time graph using the information in **Table 3**.

   (b) Using your graph, calculate the average acceleration of the cheetah.

   (c) Using your graph, calculate the total distance travelled by the cheetah by the end of 2.0 s.

Table 3	Acceleration of Cheetah
Time (s)	**Speed (m/s)**
0.0	0.0
0.5	5.0
1.0	10.0
1.5	15.0
2.0	20.0

8. Sketch and label distance–time and speed–time graphs for constant speed and a speed–time graph for constant acceleration (three graphs in total).

11. Clayton sets out on his motorcycle. His speed at different times is shown on the graph in **Figure 8**.

Clayton's Speed on his Motorcycle
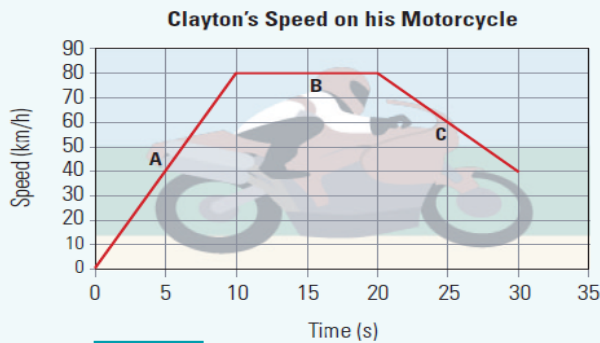
Figure 8

(a) Calculate the accelerations during each of the time intervals, A, B, and C.

(b) Without calculating, list the time intervals during which the distances travelled are, in order, from largest to smallest.

Reflecting

12. What assumption have you been making about acceleration in this chapter?