1. An object accelerates uniformly from rest at a rate of 3.0 \( \text{m/s}^2 \) [west]. What is the displacement of the object after accelerating for 15 s? (2 marks)

2. An object accelerates uniformly from rest. If the final velocity of the object after 4.7 s is 15 m/s east, what is the displacement? (2 marks)
3. An object accelerates uniformly from rest at a rate of 1.9 m/s\(^2\) [right] for 5.0 s. Determine
   a. the object’s final velocity (2 marks)
   b. and how far the object has travelled. (2 marks)

4. An object initially travelling at a velocity of 2.0 m/s [west] accelerates uniformly at a rate of 1.3 m/s\(^2\) [west]. During this time of acceleration, the displacement of the object is 15 m [west]. Determine the final velocity of the object. (2 marks)
5. An object accelerates uniformly from a velocity of 5.0 m/s [north] at a rate of 3.0 m/s$^2$ [north]. What is the velocity of the object after it has accelerated for 2.9 s? (2 marks)

6. One of the world’s fastest production cars, the Bugatti Veyron (which can be financed for about $30,000 a month for five years), can cover a quarter-mile (402 m) in 10.1 seconds. Assuming uniform acceleration from rest, what is the final speed of the car at the end of the quarter-mile? (2 marks)
7. Usain Bolt ran the 100 m dash in the London Olympics in a time of 9.63 s. Assuming he accelerated uniformly from start to finish, what was his average rate of acceleration? (2 marks)

8. A car accelerates uniformly from 60 km/h to 100 km/h. The car’s rate of acceleration is 6.5 m/s².
   a. How far does the car travel during its acceleration? (2 marks)
   b. How long does it take? (2 marks)
9. An object accelerates uniformly from rest at a rate of \(2.40 \text{ m/s}^2\). How long does it take for the object to reach a speed of \(12.0 \text{ m/s}\)? (2 marks)

10. A baseball pitcher throws a fastball at a speed of \(31.7 \text{ m/s}\). During the throwing motion, the pitcher accelerates the ball from rest over a distance of \(3.50 \text{ m}\). Calculate the magnitude of the average acceleration of the ball during the throwing motion. (2 marks)
ANSWERS

UNIFORM ACCELERATION

1. $3.4 \times 10^2$ m [west]
2. 35 m [east]
3. 9.5 m/s [right], 24 m
4. 6.6 m/s [west]
5. 14 m/s [north]
6. 79.6 m/s or 287 km/h
7. 2.16 m/s$^2$
8. 38 m, 1.7 s
9. 5.00 s
10. 144 m/s$^2$