

## Unit 1 – Position, Velocity, Acceleration

### Problem Sheet

#### Section A – Displacement and Velocity

1. An ant crawls along a meter stick from the 0.2 meter mark to the 0.7 meter mark. What is its displacement?
2. I am running on the greenline. I start at the 2.5 mile marker and run to the 7 mile marker. How far have I run?
3. Sonic the hedgehog moves 20 meters in 4 seconds. What is his velocity?
4. My roommate's pet fish, Fabio, can swim 1 meter in 10 seconds. What is his velocity?
5. A NASCAR driver drives 500 meters in 20 seconds. What is his/her velocity?
6. An ant crawls 0.5 meters in 10 seconds. What is its velocity?
7. I run at 3 m/s for 70 seconds. How far do I travel?
8. A plane travels for 40 minutes (2400 seconds) at a velocity of 500 m/s. What distance does it travel in this time?
9. My dog runs at 6 m/s for 18 meters. How long did she run for?
10. A cat walks 5 meters in 10 seconds. What is its velocity?
11. I push a box at 5 m/s for 50 seconds. How far did I go?
12. I ride my bike from mile marker 9 to mile marker 1.5 on the Green Line. What is my displacement?
13. An ant crawls from the 0.5 meter mark to the 0.9 meter mark on a meter stick in 10 seconds. What is its velocity?
14. How long would it take a bird to fly 100 meters at 2 m/s?
15. How far can I skateboard in 40 seconds if I'm traveling at 4 m/s?

#### Section B - Acceleration

16. I accelerate my car from 10 m/s to 50 m/s in 10 seconds. What is my acceleration?
17. I start my car from a red light and get up to 8 m/s in 2 seconds. What is my acceleration?
18. A horse is running at 10 m/s and slows down to 2 m/s in 6 seconds. What is its acceleration?
19. I am driving at 10 m/s and accelerate at 3 m/s<sup>2</sup> for 4 seconds. What is my final velocity?
20. An ant is crawling at 0.2 m/s and accelerates for 1 second at 0.1 m/s<sup>2</sup>. What is its final velocity?
21. I accelerate at 5 m/s<sup>2</sup> for 10 seconds and end up with a velocity of 25 m/s. What was my initial velocity?
22. An ant is crawling at 0.2 m/s and accelerates for 1 second at -0.1 m/s<sup>2</sup>. What is its final velocity?
23. A car accelerates at 5 m/s<sup>2</sup> from 10 m/s to 45 m/s. How long does this take?
24. I am going 30 m/s and slam on the brakes and come to a stop in 5 seconds. What is my acceleration?
25. I am running at 4 m/s and turn around to run at -5 m/s in 12 seconds. What is my acceleration?
26. The acceleration of an airplane from rest is 40 m/s<sup>2</sup>. How long will it take the plane to reach a velocity of 200 m/s?
27. A trolley car is traveling at 15 m/s and accelerates at -2 m/s<sup>2</sup>. How long will it take to stop?
28. A jaguar stops running in 5 seconds. Its acceleration was -1 m/s<sup>2</sup>. What was its initial velocity?
29. Give a real life example of a positive acceleration value (you don't need real numbers).
30. Give a real life example of a negative acceleration value (you don't need real numbers).