

Practice for 2.2 - Acceleration

(Do the work for these on a separate sheet of paper.)

$$a = \frac{\Delta v}{t} :$$

1. A car's brakes can make it slow at a rate of -6.70 m/s/s . What time will it take the car to stop if it is going 28.1 m/s ? (4.19 s)
2. A drag racer reaches a speed from rest of 54.2 m/s in 1.83 seconds. What was its acceleration? (29.6 m/s/s)
3. A javelin is accelerated at 15.6 m/s/s for 1.30 seconds. What is its change in velocity? (20.3 m/s)
4. A runner accelerates at 4.80 m/s/s for 1.39 seconds. What is their change in velocity? (6.67 m/s)
5. What time will it take a rock accelerating at 32.0 f/s/s to reach 44.0 f/s ? (1.375 s)
6. A car reaches a speed of 22.5 m/s in 2.70 seconds from rest. What is its acceleration? (8.33 m/s/s)
7. A giant lizard goes from rest to 4.50 m/s in 2.54 seconds. What is its acceleration? (1.77 m/s/s)
8. A rocket can accelerate at 6.97 m/s/s . What time will it take to change the velocity of the rocket by 1200 m/s ? (172 s)
9. What is the change in velocity of a baseball if a pitcher accelerates it at 85.1 m/s/s for 0.320 seconds? (27.2 m/s)
10. What time will it take a baseball accelerated by a pitching machine at 92.0 m/s/s to reach 41.5 m/s from rest? (0.451 s)
11. A car at a stoplight accelerates from rest to 21.0 m/s in 4.81 seconds. What is its acceleration? (4.37 m/s/s)
12. A rocket accelerates at 45.0 m/s/s for 2.30 seconds. What is its change in velocity? (103.5 m/s)
13. A runner goes from rest to 8.10 m/s in 2.70 seconds. What is their acceleration? (3.00 m/s/s)
14. A tennis ball is accelerated at $160. \text{ m/s/s}$ from rest to 78.0 m/s . What time does it take? (0.4875 s)
15. A train can accelerate at 0.382 m/s/s . What is its change in velocity if it accelerates at this rate for 120. seconds? (45.8 m/s)

$$\mathbf{v_f = v_i + at} :$$

16. A car accelerates at 3.54 m/s/s from 22.0 m/s to 35.0 m/s . What time does it take? (3.67 s)
17. A car accelerates from 17.4 m/s to 36.1 m/s in 6.00 seconds. What is its acceleration? (3.12 m/s/s)
18. A car coasts along the road, slowing from 23.0 m/s to 12.0 m/s in 18.2 seconds. What is its acceleration? (-0.604 m/s/s)
19. A train going 34.8 m/s decelerates at a rate of -1.40 m/s/s for 18.2 seconds. What is its final velocity? (9.32 m/s)
20. An oil tanker accelerates from 4.30 m/s to 14.8 m/s at a rate of 0.172 m/s/s . What time does it take? (61.0 s)
21. A bullet going 816 m/s decelerates at -151 m/s/s for 1.20 s. What is its final velocity? (634.8 m/s)
22. A car accelerates at 5.75 m/s/s for 2.68 seconds. At the end, it is going 28.0 m/s , so what was its initial velocity? (12.6 m/s)
23. A car going 15.7 m/s accelerates at 4.35 m/s/s for 9.00 seconds. What is its final velocity? (54.85 m/s)
24. A car going 27.2 m/s is slowed at -5.30 m/s/s to 12.9 m/s . What time does it take? (2.70 s)
25. A car is decelerating at -7.46 m/s/s , and is still going 11.5 m/s after 2.60 seconds. What was its initial velocity? (30.9 m/s)