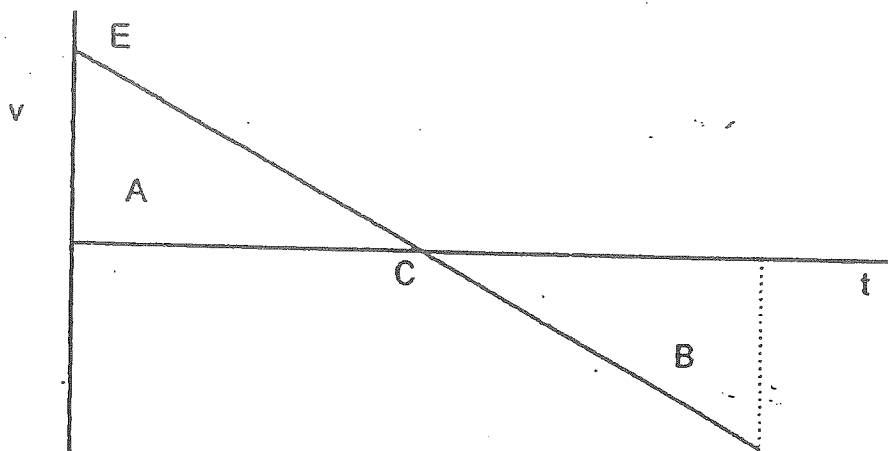


A

Physics 11 Worksheet - Kinematics

recall: acceleration due to gravity is 9.8 m/s^2

1. A stone is thrown up vertically with a speed of 15.0 m/s . A sketch of the velocity-time graph for the motion is shown below.



- (a) How long does it take to get to its highest point?
(b) What is the speed at each of the points E, C and F?
(c) Why is area A equal to area B?
(d) At what stage of its flight is the stone when it is at C?
2. "Darryl-the-wonder-dog" was a very talented pup. One of his skills was throwing and catching his tennis ball. On one throw, the ball went vertically into the air to a height of 6.8 m .
- (a) How long did he have to wait to catch the ball on its way down?
(b) What was the ball's initial velocity?
(c) What was its final velocity?
3. A ball is thrown vertically upwards with a velocity of 12.0 m/s .
- (a) At what height is the ball 1.0 s later?
(b) At what height is the ball 2.0 s after being thrown?
(c) What is the maximum height the ball reaches?
4. The Empire State building in New York city is 449 m high.
- (a) How long would it take a 1500 kg elephant dropped from the top of the building to reach the ground?
(b) What would its final velocity be?

B

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2



- 5) A javelin thrower carrying a spear while running at 6.0 m/s thrusts the spear ahead with an acceleration of 250 m/s^2 for 0.10 s . What is the speed with which the javelin leaves the thrower's hand?
- 6) (a) If an Olympic cyclist reaches 18.0 m/s from a standing start in 20.0 s , what is his average acceleration?
(b) What distance does he travel in that time?
- 7) If a skier accelerates steadily down a hill from 3.50 m/s to 11.40 m/s in 4.20 s , what distance does she travel?
- 8) A frustrated physics student threw his textbook into the air with a speed of 8.0 m/s from a height of 1.0 m . If the acceleration of the book was 9.8 m/s^2 (towards the earth), how high did the book fly before falling down?
- 9) In a panic stop a car's brakes can produce an acceleration of -8.0 m/s^2 . If you are driving at 100 km/h , what is your minimum stopping distance?

10

The data table below shows the velocity of a car.
(a) On the graph paper provided, draw a graph of the points on the data table. Include all required elements in the graph.

velocity (m/s)	11.3	10.0	9.1	8.0	7.0	5.8	4.7	3.75	2.8	2.9	2.8
time (s)	0.0	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12	13.5	15

- (b) In words, describe the motion of the car.
- (c) Calculate the slope of the line of best fit for the portion of the graph between $t = 0.0 \text{ s}$ and $t = 11.0 \text{ s}$.
- (d) What is the equation of the line of best fit for the portion of the graph between $t = 0.0 \text{ s}$ and $t = 11.0 \text{ s}$?