

Motion Test Review Guide

Name _____ Class _____ Date _____

TEST DATE: Wednesday, January 18th

1. Define motion - *Change in position relative to a reference point*
2. Define distance - *measure of how far an object moves (meters)*
3. Define displacement - *Change in position from starting point*
4. What are the SI units used to measure distance? *meters, m*
5. Draw the S-T-D triangle.

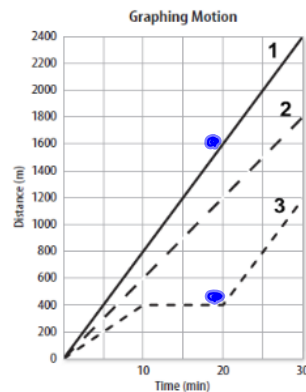
- a. Write the formula for calculating speed - $S = \frac{d}{t}$
- b. Write the formula for calculating distance - $d = S \times t$
- c. Write the formula for calculating time - $t = \frac{d}{S}$



6. Distinguish between average speed and instantaneous speed - *Any given moment*
TOTAL distance
TOTAL time

7. Use the graph to complete the following:

- a. What information is recorded on the x-axis?
Time
- b. How many minutes does each line on the x-axis represent?
5 min.
- c. In what units is distance measured?
m
- d. The lines represent three swimmers. What do the lines tell you about the swimmers?



- Speed of each swimmer*
- e. Which swimmer swam the fastest? *1*
 - f. Which swimmer stopped for ten minutes?
3
 - g. How far did swimmer 2 travel in 15 minutes? *900 m*
 - h. How much farther than the slowest swimmer did the fastest swimmer travel in 20 minutes?
1200 m
- 1600 - 400*

7. Explain the difference between speed and velocity.

Velocity includes direction

8. Define acceleration.

Rate of change of velocity

9. Explain the difference between positive and negative acceleration.

+ → Speeding up - → Slowing down

10. How is acceleration calculated?

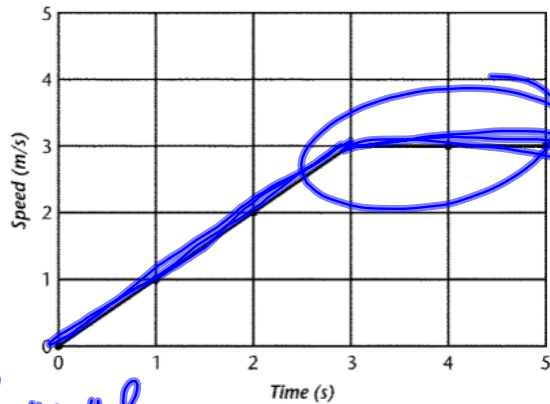
$$a = \frac{V_f - V_i}{t}$$

11. What do the following units represent? Use **D** for distance, **T** for time, **S** for speed, or **A** for acceleration.

- | | | | | | | | |
|---------------|-----------|---------------|-------------------------|---------------|------------|---------------|-----------------|
| $\frac{D}{S}$ | a. 14 km | $\frac{T}{A}$ | d. 6 hours | $\frac{d}{t}$ | g. 14 mi | $\frac{d}{A}$ | j. 1.4 m |
| $\frac{S}{T}$ | b. 30 m/s | $\frac{S}{A}$ | e. 12 cm/s ² | $\frac{A}{t}$ | h. 3.2 sec | $\frac{A}{A}$ | k. 6 cm/min/sec |
| $\frac{T}{S}$ | c. 34 min | $\frac{S}{S}$ | f. 150 mph | $\frac{A}{d}$ | i. 25 ft | $\frac{A}{A}$ | l. 3 km/hr/sec |

Use the diagram to answer questions 12-17.

Speed of a Ball Rolling Down a Ramp Onto the Floor



12. What two variables are plotted in the graph?

X = time y = speed

13. What does the line segment on the graph from 0 to 3 seconds represent? Explain your answer.

Ball is accelerating

14. What is the acceleration of the ball between 0 and 3 seconds?

$\boxed{1 \text{ m/s}^2}$ $\frac{V_f - V_i}{t} = \frac{3 \text{ m/s} - 0 \text{ m/s}}{3 \text{ s}}$

15. What happened to the speed of the ball during the final two seconds?

Constant - does not change

16. Does the graph indicate that the ball decelerated? Explain your answer.

No - line does not slope down

17. How far did the ball move in the final 2 seconds?

$D = S \times t = 3 \text{ m/s} \times 2 \text{ s} = \boxed{6 \text{ m}}$