Name (Key) Quiz 1 [#1] Motions ~~Test~~ Review HW

1. Mike travelled the same distance walking, riding a bike, and driving a car. For each mode of travel, the table shows his average speed and the amount of time required to travel the distance.

MODE	SPEED (kilometers per hour)	TIME (minutes)
walking	5	120
riding a bike	10	60
driving a car	60	10

As Mike's speed increased, how did the amount of time change?

1) ~~Time increased proportionally.~~
2) Time decreased proportionally. (circled)
3) ~~Time increased randomly.~~
4) Time decreased randomly.

2. A car travels at 84 kilometers per hour for 7 hours. How far did it travel?

1) 12 km
2) 84 km
3) 91 km
4) 588 km (circled)

$\frac{84 km}{hr} \times 7 hrs = 588 km$

Distance = Speed x time

3. How long will it take an object to move 100 meters if the object is traveling with an average speed of 0.5 meter per second?

1) 200 s (circled)
2) 2 s
3) 5 s
4) 50 s

$Time = \frac{Distance}{speed}$

$= \frac{100 m}{.5 m/sec}$

$= 200 sec$

4. A car travels between the 100.-meter and 250.-meter highway markers in 10. seconds. The average speed of the car during this interval is

1) 10. m/s
2) 15 m/s (circled)
3) 25 m/s
4) 35 m/s

$Speed = \frac{distance}{time}$

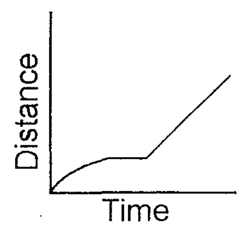
$= \frac{250m - 100m}{10 sec} = \frac{150}{10}$

$= 15 m/s$

5. A moving body must undergo a change of

1) velocity
2) acceleration
3) position (circled)
4) direction

6. Anne traveled from her home to a friend's house. She constructed this graph to show the relationship between the time and the distance traveled.

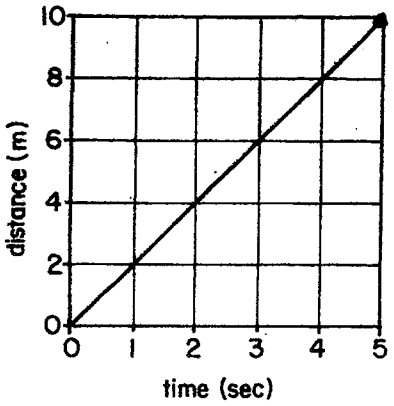


Which description is most consistent with the graph?

1) Anne started her trip on a country road. She stopped for lunch just before getting onto a superhighway for the rest of her trip. (circled)
2) Anne drove briefly on a superhighway, then on a country road, and finished her trip on a superhighway.
3) Anne started her trip on a superhighway. She stopped for lunch just before getting onto a country road for the rest of her trip.
4) Anne drove briefly on a country road, then on a superhighway, and finished her trip on a country road.

[Key]

7. The uniform motion of a cart is shown in the distance versus time graph below. What is the average speed of the cart?



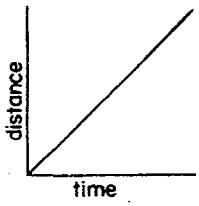
$\text{speed} = \frac{\text{distance}}{\text{time}}$

$= \frac{10\text{m}}{5\text{sec}}$

$= 2\text{m/s}$

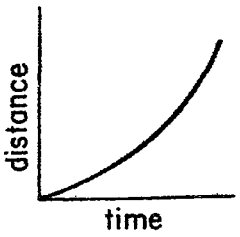
1) 0.5 m/s
2) 2 m/s
3) 5 m/s
4) 50 m/s

8. The graph at the right represents the motion of a body that is moving with



1) increasing acceleration
2) decreasing acceleration
3) increasing speed
4) constant speed

9. The graph at the right represents the relationship between distance and time for an object moving in a straight line. Acccording to the graph, the object is



1) motionless
2) moving at a constant speed
3) decelerating
4) accelerating

10. A runner changing speed from 3 meters per second to 5 meters per second is an example of

1) acceleration.
2) velocity.
3) changing direction.
4) constant speed.

$V = 0$

11. A bicyclist accelerates from rest to a speed of 5.0 meters per second in 10. seconds. During the same 10. seconds, a car accelerates from a speed of 22 meters per second to a speed of 27 meters per second. Compared to the acceleration of the bicycle, the acceleration of the car is

1) less
2) greater
3) the same
4) constant speed

Bike $a = \frac{\Delta V}{t} = \frac{5\text{m/s} - 0\text{ m/s}}{10\text{s}} = .5\text{ m/s}^2$

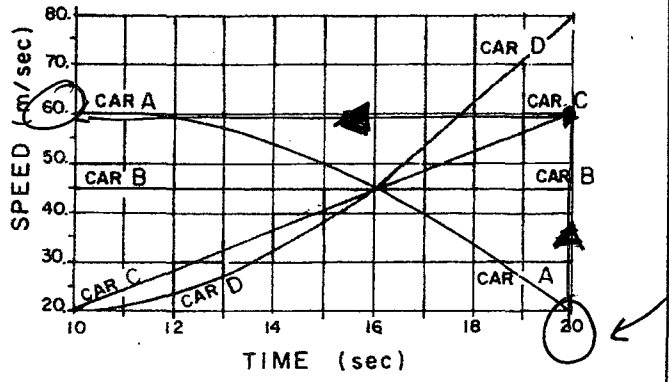
Car $a = \frac{\Delta V}{t} = \frac{27\text{m/s} - 22\text{m/s}}{10\text{s}} = .5\text{m/s}^2$

12. Which statement about the movement of an object with zero acceleration is true?

1) The object must be at rest.
2) The object must be slowing down.
3) The object may be speeding up.
4) The object may be in motion.

(KEY)

Base your answers to questions **13** through **15** on the accompanying graph which represents the motions of four cars on a straight road.



13. Which car is decelerating?

1) *A* → Velocity drops from 60 m/s to 20 m/s.

2) *B*

3) *C*

4) *D*

14. Which car has zero acceleration?

1) *A*

2) *B* → speed stays constant @ 45 m/s

3) *C*

4) *D*

15. The speed of car *C* at t = 20 seconds is closest to

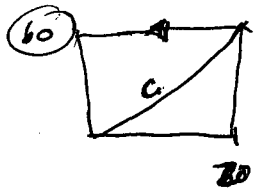
1) 60 m/sec

2) 45 m/sec

3) 3.0 m/sec

4) 600 m/sec

use graph.



Key

Speed and Acceleration Problems

Step 1: Write the equation
Step 2: Substitute with units
Step 3: Solve the equation with units rounding to the nearest 0.1

1) A trip to Cape Canaveral, Florida takes 10 hours and the distance is 816 km. Calculate the average speed.

STEP 1: $\text{Average Speed} = \frac{\text{distance}}{\text{time}}$

STEP 2: $= \frac{816\text{km}}{10\text{ hrs}}$

STEP 3: $= 81.6\ \text{km/hr}$

2) What is the speed of a walking person in m/s if the person travels 1000 meters in 20 minutes?

STEP 1: $\text{Average Speed} = \frac{\text{distance}}{\text{time}}$

STEP 2: $= \frac{1000\text{m}}{20\text{ min}}$

STEP 3: $= 50.0\ \text{m/min}$

3) What is the speed of a rocket that travels 9000 meters in 12.12 seconds?

STEP 1: $\text{Average Speed} = \frac{\text{distance}}{\text{time}}$

STEP 2: $= \frac{9{,}000\text{m}}{12.12\text{ s}}$

STEP 3: $= 742.6\ \text{m/s}$

Key

4) A ball rolls down a ramp for 15 seconds. If the initial velocity of the ball was 0.8 m/sec and the final velocity was 7 m/sec, what was the acceleration of the ball?

STEP 1: $a = \frac{V_f - V_i}{t}$

STEP 2: $= \frac{7\,m/s - .8\,m/s}{15\,s} = \frac{6.2\,m/s}{15\,s}$

STEP 3: $= .4\,m/s^2$

5) A ball is rolled at a velocity of 12 m/sec. After 36 seconds, it comes to a stop. What is the acceleration of the ball?

STEP 1: $a = \frac{V_f - V_i}{t}$

STEP 2: $= \frac{0 - 12\,m/s}{36\,s}$

STEP 3: $= -.3\,m/s^2$

6) A car going 50mph (V_i) accelerates to pass a truck. Five seconds later the car is going 80mph (V_F). Calculate the acceleration of the car.

STEP 1: $a = \frac{V_F - V_i}{t}$

STEP 2: $= \frac{80mph - 50mph}{5s}$

STEP 3: $a = 6.0\,\frac{mph}{s}$