








## DISTANCE, RATE, AND TIME

- 1** If distance = rate x time, which of the following must also be true?
- A** Rate = distance x time  
**B** Time = distance/rate  
**C** Distance = rate/time  
**D** Time = rate/distance
- 2** If a train travels at a speed of 100 km/hr, how far will it travel in half an hour?
- A** 100 km  
**B** 50 km  
**C** 25 km  
**D** 10 km
- 3** If a jogger runs a 10-kilometer race in 60 minutes, what is her average speed?
- A** 10 km/hr  
**B** 5 km/hr  
**C** 6 km/hr  
**D** 1.66 km/hr
- 4** If a car travels at 40 km/hr for 4 hours, how much distance has it covered?
- A** 160 km  
**B** 140 km  
**C** 120 km  
**D** 100 km
- 5** An aircraft carrier travels a distance of 1,000 km in 3 days. What is its average rate of speed?
- A** 1,000 km/hr  
**B** 3,000 km/hr  
**C** 333.3 km/hr  
**D** 13.9 km/hr
- 6** A train leaves New York traveling at a speed of 90 km/hr. How much distance will it cover in five hours?
- A** 45 km  
**B** 450 km  
**C** 180 km  
**D** 18 km
- 7** If a train travels 1,600 km in 16 hours, how fast is it moving?
- A** 60 km/hr  
**B** 100 km/hr  
**C** 120 km/hr  
**D** 90 km/hr
- 8** If a person ran 32 kilometers at a rate of 8 kilometers/hr, how long did he run?
- A** 6 hours  
**B** 8 hours  
**C** 4 hours  
**D** 12 hours
- 9** A crosstown bus travels 8 kilometers in 45 minutes. What is its average rate of speed?
- A** 4 km/hr  
**B** 6.67 km/hr  
**C** 8 km/hr  
**D** 10.67 km/hr
- 10** Which of the following steps is important in solving distance, rate, and time problems?
- A** Working quickly  
**B** Doing whole problems in your head  
**C** Drawing diagrams  
**D** Memorizing the average speeds of different trains



## FORCE

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- 1** What happens when an unbalanced force is applied to an object at rest?
- A** It accelerates  
**B** It remains at rest  
**C** It gains mass  
**D** It loses momentum
- 2** Which of the following is a unit of acceleration?
- A** 40 kilometers per hour  
**B** 40 newtons per gram  
**C** 40 meters per second per second  
**D** 40 joules per second
- 3** What do measurements of velocity and acceleration have in common?
- A** Mass is a factor in both measurements  
**B** Time is a factor in both measurements  
**C** Force is a factor in both measurements  
**D** Acceleration is factor in both measurements
- 4** If you were driving a car, and wanted to accelerate at a rate of -10 m/s/s, what would you do?
- A** Step on the brake  
**B** Step on the gas  
**C** Open the windows  
**D** Shift from fourth to fifth gear
- 5** Which of the following can change the acceleration of a car?
- A** Changing its oil  
**B** Changing direction  
**C** Turning the key in the ignition  
**D** Filling the tank with gas
- 6**  Approximately how fast is this ball accelerating?
- A** 2 m/s/s  
**B** 5 m/s/s  
**C** 8 m/s/s  
**D** 10 m/s/s
- 7** If a 10 kg object is accelerating at a rate of 2 m/s/s, how much force does it have?
- A** 5 newtons  
**B** 12 newtons  
**C** 20 newtons  
**D** 8 newtons
- 8** Objects can easily slide past each other when the force of friction between them is low. Which of the following examples has the least amount of friction?
- A**   
**B**   
**C**   
**D** 
- 9** What is the mass of an object that has 50 newtons of force and is accelerating at a rate of 2 m/s/s?
- A** 100 kg  
**B** 25 kg  
**C** 48 kg  
**D** 52 kg
- 10** Why were units of force named after Sir Isaac Newton?
- A** Newton was the British King when the units were named  
**B** Newton figured out the relationship between force, mass, and acceleration  
**C** Newton founded the institution that named the units  
**D** Newton was a very popular politician at the time



# ACCELERATION

1 What does speed measure?

- A How fast an object is going
- B How far an object has traveled
- C The rate at which an object slows down
- D The rate at which an object speeds up

2 Which of the following can be used to measure an object's speed?

- A Joules
- B Newtons
- C Miles per hour
- D Kilometers per second per second

3 What does acceleration measure?

- A How fast an object is going
- B The fastest speed that an object can reach
- C The force with which an object travels
- D The rate at which speed or direction changes

4 What is the difference between positive and negative acceleration?

- A Positive acceleration applies to fast objects; negative acceleration applies to slow objects
- B Positive acceleration occurs when objects speed up; negative acceleration occurs when objects slow down
- C Positive acceleration applies to objects traveling on earth; negative acceleration applies to objects traveling in space
- D Positive acceleration is expressed in meters per second; negative acceleration is expressed in kilometers per hour

5 Which of these is an example of acceleration?

- A A car coasts along at 40 km/hr
- B A car is parked on the side of the road
- C A speeding car brakes to a stop
- D A car speeds along at 100 km/hr

6 Which of these statements is true?

- A Acceleration in the direction of motion slows you down
- B Acceleration in the direction of motion speeds you up
- C Acceleration against the direction of motion has no effect on your speed
- D Acceleration against the direction of motion speeds you up

7 If you're sitting still in a chair reading this, what is your acceleration?

- A 0 m/s/s
- B 1 m/s/s
- C 2 m/s/s
- D 3 m/s/s

8 When would acceleration increase most?

- A Rolling along a flat plane
- B Rolling down a steep hill
- C Braking to a stop
- D Rolling up a gently sloping hill

9  How does braking stop a bike?

- A It makes the wheels turn backwards a few times
- B It pumps up the tires slightly so they cannot roll forward
- C It causes a quick negative acceleration against the bike's forward motion
- D It causes a quick positive acceleration against the bike's backward motion

10 Which variables must you know to calculate acceleration?


- A Distance and force
- B Speed and distance
- C Velocity and time
- D Change in speed and time



# GRAVITY

1 What is gravity?

- A A type of current
- B A type of force
- C A type of wave
- D A type of energy

2  According to Sir Isaac Newton, gravity depends on two factors. What are they?

- A Mass and distance
- B Volume and density
- C Size and shape
- D Mass and volume

3 The moon's gravity is one-sixth of Earth's gravity. If you weigh 100 Newtons on Earth, how much do you weigh on the moon?

- A 1 newton
- B 6 newtons
- C 16.667 newtons
- D 60 newtons

4 How does the sun's gravity compare to the earth's gravity?


- A The sun's gravity is stronger
- B The earth's gravity is stronger
- C Their gravitational pull is the same
- D Scientists aren't able to measure the sun's gravity

5 Why is the earth's gravity stronger than the moon's gravity?

- A The earth is more massive than the moon
- B The moon is so far away from earth
- C The moon has no mass
- D The earth has a larger volume than the moon

6 According to Newton's laws, what might happen to the earth if its orbit moved further away from the sun?

- A The sun's gravitational pull on the earth would increase
- B The earth's gravitational pull on the moon would increase
- C The sun's gravitational pull on the earth would stay the same
- D The sun's gravitational pull on the earth would decrease

7  What theory did Albert Einstein introduce to challenge Newton's ideas?


- A The theory of superlativity
- B The theory of gravitation
- C The theory of relativity
- D The theory of specificity

8 According to Einstein, gravity:

- A Makes objects fall upward
- B Doesn't exist when masses are very large
- C Makes objects bend in space
- D Bends space and time

9 Which of these would have the strongest gravitational pull?

- A A large, dense star
- B A medium-sized planet
- C A small moon
- D A comet

10  What effect does the moon's gravity have on the earth?

- A It keeps the earth in orbit around the sun
- B It causes the tides
- C It causes space and time to bend around the earth
- D It has no effect on the earth