Introduction to Physics : Quiz-60

1) Define the following terms:

a) mass

b) force

c) weight

d) net force

e) velocity

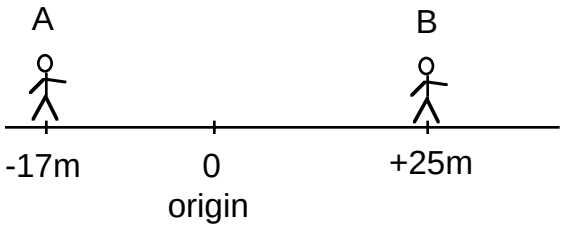
f) acceleration

2) Write down the units for each of the following:

a) mass _____ , b) force _____ , c) weight _____

d) speed _____ , e) acceleration _____ .

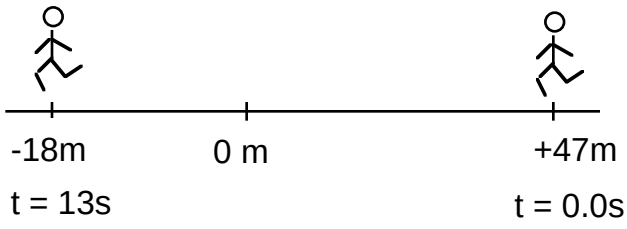
3)



In the diagram above answer the following questions.

The displacement of A is _____ . The displacement of B is _____ . The distance between A and B is _____ . The displacement of A relative to B is _____ .

4) A boy runs towards the left at a constant speed.



a) His speed is _____ . His velocity is _____ .

b) Find his displacement at t = 3 seconds. _____ .

c) At what time will his displacement be equal to -8m? _____ .

5) A car accelerates at a rate of +3.0 m/s^2. The initial velocity (at time t = 0) is zero.

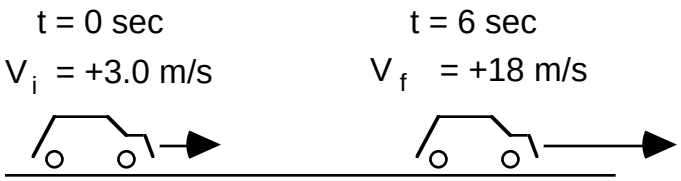
a) What is the velocity at 5.0 seconds? v = _____ .

b) At what time is the velocity equal to +27 m/s? t = _____ .

6)a) The acceleration due to gravity is _____ .

b) If an object is dropped near the Earth's surface, find the velocity at a time of 3.0s. v = _____ .

7)a) Find the acceleration of the car shown below. a = _____ .



b) Find the velocity at a time t = 8 seconds. v = _____ .

8) Which of Newton's Laws is given below? Give the number.

a) A boy's weight is -250N. The ground exerts a force of +250N on him.

b) A spaceship moves in a straight line at a constant speed when the engines are turned off.

c) A falling object accelerates downward because of the force of gravity.

9) A man pulls a box along the floor at a constant speed with a force of +95N. The mass of the box is 35 kg. Answer the following questions.

a) The weight of the box is _____ .

b) The normal force is _____ .

c) The force of friction is _____ .

d) The net force is _____ .

10)a) What is Newton's **<u>Law of Universal Gravitation,</u>** stated in words.

b) What is G?

c) Find the force of gravity between the Earth and the Moon.

Mass of Earth is 6.0×10^{24} kg

Mass of Moon is 7.4×10^{22} kg

Distance to Moon is 3.8×10^{8} m

11)a) Find the weight of a 4.0 kg book on the Earth.

b) Find the weight of the book on the moon.

c) Find the mass of the book on the moon.

12) An object has a weight on the Earth's surface of 360 N. The Earth's radius is 6400 km.

a) What is the weight of the object in orbit if its distance from the Earth's center is 12,800 km.

b) What is the weight of the object in orbit if its distance from the Earth's center is 19,200 km.

Answers: 1)a) It is the quantity of matter., b) It is a push or a pull., c) It is the force of gravity acting on an object., d) It is the total force acting on an object., e) It is the displacement/time., f) It is the velocity/time, 2)a) kg, b) N, c) N, d) m/s, e) m/s^2, 3) -17m, +25m, 42m, -42m, 4)a) 5.0m/s, -5.0m/s, b) +32 m, c) 11s, 5)a) +15 m/s, b) 9s, 6)a) -9.8m/s, b) -29.4m/s, 7)a) +2.5m/s, b) +23m/s, 8)a) 3, b) 1, c) 2, 9)a) -343N, b) +343N, c) -95N, d) 0.0N, 10)a) Any two masses exert an attractive force on each other., b) G is the universal gravitational constant. It is equal to $6.7x10^{-11}$ Nm^2/kg^2., c) $2.1x10^{20}$ N, 11)a) -39.2N, b) -6.4N, c) 4.0 kg, 12)a) 90 N, b) 40 N.