Force and Motion Exam Review 2018   Name_____

Part 1. Motion

I. Speed and Velocity:

1. Draw the "Speed Equation Triangle"

2. What is the difference between speed and velocity?

3. A model walks down a 45 meter runway at a fashion show and makes it to the end of the runway in 17 seconds. What is the velocity of the model?

4. A hockey player hits a hockey puck which flies 30 feet into a net with a speed of 48 feet/second. How much time did it take for the puck to score?

5. volleyball player hits a ball with a speed of 12 feet per second and the ball travels for 4.5 seconds. How far did the ball travel?
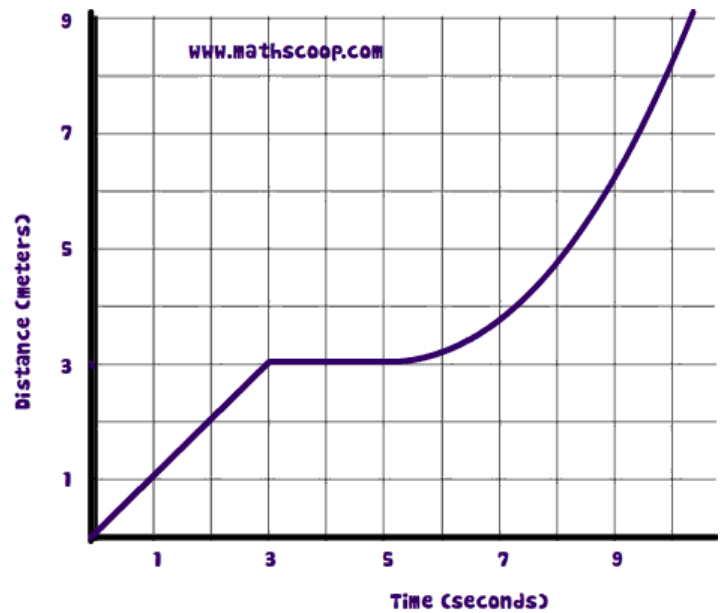
II Acceleration:

1. What is the equation for acceleration?

2. Clayton Kershaw hurls a pitch which starts in his hand at 0 m/s and reaches the plate 1.2 seconds later at a rate of 30 m/s. What is the acceleration of the baseball?

3. Usain Bolt, the fastest man on earth, begins a race at the starting line. Then the gun goes off and he reaches his top speed of 24 m/s in only 2.5 seconds. What is the acceleration of Usain Bolt?

4. A car is traveling down the road for 5 seconds at a constant rate of 26 m/s then speeds up to 47 m/s which takes 3 seconds. What is the acceleration of the car?

III Motion Graphs:

Describe the motion for each of the following graphs

1.

position / time

2.

Position (m) / Time (s)

3.

Position (m) / Time (s)

4.

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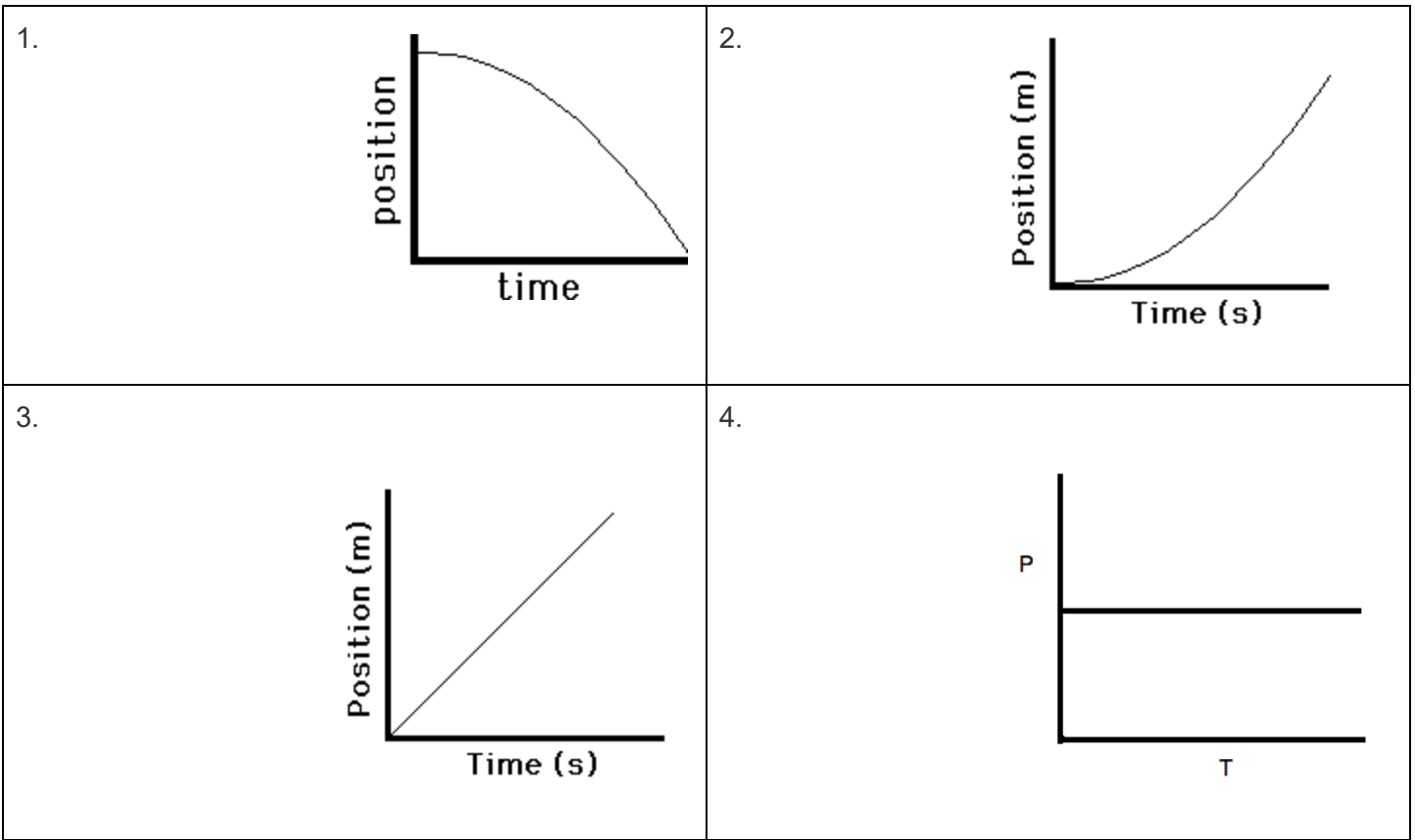
5. Write a story for the following graph

Distance (meters) / Time (seconds)

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Part 2: Forces

IV. Newton's Laws

1)   Newton's first law is known as the "Law of _____" and states that Objects

in _____ stay in _____, objects at _____ stay

at _____unless acted upon by an _____

force.

2)   Newton's second law states that _____ is equal to

_____ multiplied by _____.

3)   Newton's third law states that every _____ force has an

_____ and _____ reaction _____.

V. Calculating Force

1) Draw the "Force Equation Triangle"

2) You are pushing a 32kg shopping cart with an acceleration of 12 m/s^2 how much force are you pushing
with?

3) While racing with an acceleration of 53 m/s^2 a 1,200 kg car crashes into a wall. With how much force does
the
        car hit the wall?

4) A football player tackles another football player with a force of 560 N while running with an acceleration of
        3 m/s^2 what is the mass of the football player?

5) What is the mass of a falling object hitting a surface with 15N of force?

VI. Free Body Diagrams
1) Calculate the **NET** force for each diagram and include a direction arrow if appropriate.

11N   15N

10N

15N

3N

18N

10N

14N   5N

22N

11N

13N

17N

7N   12N
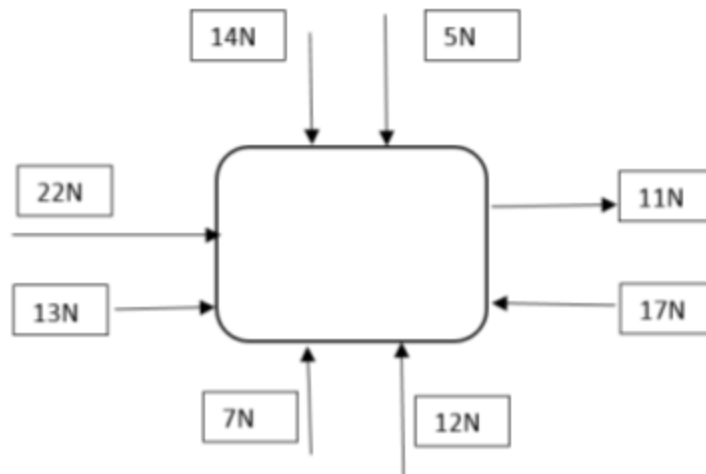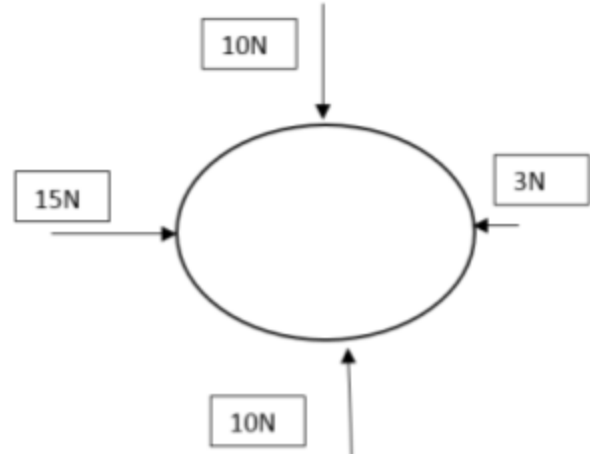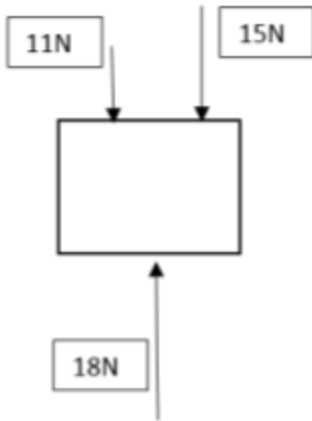
2) **Complete the Free Body Diagrams**

A light bulb hangs from a wire in the kitchen carpet

A box is pushed to the right across a

A box is pushed to the left across a hockey rink

A ball is thrown straight up in the air as the wind blows it to the left