Top of Form

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| 1. | STUDY GUIDE NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Motion, force and friction BLOCK \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  DATE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  A hockey puck slides across an ice rink more easily than it does across a rough concrete surface. Why is this? | | | |
|  | | **A.** | There is more friction on the ice rink. |

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|  | **B.** | There is more gravity on the ice rink. |

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|  | **C.** | There is less gravity on the ice rink. |

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|  | | **D.** | There is less friction on the ice rink. |
| 2. | A train is speeding down a railroad track at a speed of 50 miles per hour.  From whose reference point is the train not moving? | | | |

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|  | **A.** | a person sitting on the tracks 1 mile behind the train |

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|  | **B.** | a person sitting on the tracks 1 mile in front of the train |

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|  | **C.** | a person sitting on the train |

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|  | **D.** | a person standing to the side of the railroad tracks |

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| 3. | \_\_\_\_\_\_\_ measures an object's change in position per unit time. | | | |
|  | | **A.** | Acceleration |

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|  | **B.** | Force |

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| --- | --- | --- |
|  | **C.** | Distance |

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|  | | **D.** | Speed |
| 4. | How would the forces on the book best be described? | | | |

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|  | **A.** | The forces on the book cause a change in the book's motion. |

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|  | **B.** | The forces on the book are balanced. |

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|  | **C.** | The forces on the book do not cancel each other out. |

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|  | **D.** | The forces on the book are unbalanced. |
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| 5. | Jennifer stands on one side of a filing cabinet and pushes with a force of 60 N. If Nathan wants to help Jennifer demonstrate balanced forces, what does he need to do? | | | |
|  | | **A.** | stand on the opposite side of the cabinet and push with a force of 120 N toward Jennifer |

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|  | **B.** | cause the cabinet to move |

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|  | **C.** | stand on the same side of the cabinet and push with a force of 60 N in the same direction as Jennifer |

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **D.** | stand on the opposite side of the cabinet and push with a force of 60 N toward Jennifer |
| 6. | If an object is moving at a constant speed in one direction, what is needed to change its speed or direction? | | | |

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|  | **A.** | an unbalanced force |

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| --- | --- | --- |
|  | **B.** | a balanced force |

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|  | **C.** | a long period of time |

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|  | **D.** | a short period of time |

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| 7. | Hannah just finished building a house of cards that stands four-stories high. She is worried that it will fall down.  Which of the following statements is definitely true? | | | |
|  | | **A.** | As long as nobody touches the house of cards, it will remain standing. |

|  |  |  |
| --- | --- | --- |
|  | **B.** | If no unbalanced force acts upon the house of cards, then it will remain standing forever. |

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|  | **C.** | A house of cards is too fragile and must fall down eventually. |

|  |  |  |  |
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|  | | **D.** | If Hannah adds another card to the house of cards, then it will fall down. |
| 8. | Barry knocks a baseball into the air with his bat.  Shortly after the ball is hit, it is traveling at 25 m/s to the east and parallel to the ground. After two seconds, the ball is 50 meters to the east of Barry.  Which of the following best describes the ball's direction of motion? | | | |

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| --- | --- | --- |
|  | **A.** | 25 m/s |

|  |  |  |
| --- | --- | --- |
|  | **B.** | 50 m |

|  |  |  |
| --- | --- | --- |
|  | **C.** | 2 s |

|  |  |  |
| --- | --- | --- |
|  | **D.** | east |

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| 9. | \_\_\_\_\_\_\_ can be generally defined as a change in position. | | | |
|  | | **A.** | Mass |

|  |  |  |
| --- | --- | --- |
|  | **B.** | Volume |

|  |  |  |
| --- | --- | --- |
|  | **C.** | Motion |

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **D.** | Force |
| 10. | Look at the rock sitting on the hill in the picture above. Gravity should make the rock slide down the hill. What force is acting to balance gravity, keeping the rock in place? | | | |

|  |  |  |
| --- | --- | --- |
|  | **A.** | friction |

|  |  |  |
| --- | --- | --- |
|  | **B.** | centripetal force |

|  |  |  |
| --- | --- | --- |
|  | **C.** | gravity |

|  |  |  |
| --- | --- | --- |
|  | **D.** | momentum |

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| 11. | A reference point is an object or location from which the movement of another object is determined. Which of the following could be a reference point?   |  |  | | --- | --- | | I. | a house | | II. | a moving car | | III. | a point on a map | | IV. | a person | | | | |
|  | | **A.** | I, II, and IV only |

|  |  |  |
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|  | **B.** | III only |

|  |  |  |
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|  | **C.** | I and III only |

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|  | | **D.** | I, II, III, and IV |
| 12. | The graph below shows how the position of an object changes over time.  Assuming that the motion of the object remains the same, where will the object be positioned when it has traveled for a total of 5 s? | | | |

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| --- | --- | --- |
|  | **A.** | 6 m |

|  |  |  |
| --- | --- | --- |
|  | **B.** | 4 m |

|  |  |  |
| --- | --- | --- |
|  | **C.** | 1 m |

|  |  |  |
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|  | **D.** | 5 m |

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| 13. | The motion of an object can be described by its | | | |
|  | | **A.** | position. |

|  |  |  |
| --- | --- | --- |
|  | **B.** | speed. |

|  |  |  |
| --- | --- | --- |
|  | **C.** | direction. |

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|  | | **D.** | all of these |
| 14. | An object travels a given distance at a speed of 5 m/s. If the object travels the same distance at a higher speed, how will the faster speed affect the time it takes the object to travel the distance? | | | |

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| --- | --- | --- |
|  | **A.** | It will take less time to travel the distance. |

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| --- | --- | --- |
|  | **B.** | The time will not be affected. |

|  |  |  |
| --- | --- | --- |
|  | **C.** | The time will remain constant. |

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|  | **D.** | It will take more time to travel the distance. |

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| 15. | Jenny has two identical marbles. She rolls one marble across a concrete surface with a force of 2 N. At the same time, she rolls the other marble across an icy surface with the same force.  There is a significantly greater frictional force between the first marble and the concrete surface than between the second marble and the icy surface. This means that | | | |
|  | | **A.** | the first marble will roll a longer distance than the second marble. |

|  |  |  |
| --- | --- | --- |
|  | **B.** | the second marble will slow down and stop before the first marble. |

|  |  |  |
| --- | --- | --- |
|  | **C.** | the second marble will roll exactly the same distance as the first marble. |

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **D.** | the first marble will slow down and stop before the second marble. |
| 16. | A book is sitting on the table at rest. The forces acting on the book include \_\_\_\_\_\_\_, and these forces are \_\_\_\_\_\_\_. | | | |

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|  | **A.** | gravity pushing up and friction pushing to the right; balanced |

|  |  |  |
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|  | **B.** | gravity pushing down and the table pushing up; balanced |

|  |  |  |
| --- | --- | --- |
|  | **C.** | gravity pushing up and friction pushing to the right; unbalanced |

|  |  |  |
| --- | --- | --- |
|  | **D.** | gravity pushing down and the table pushing up; unbalanced |

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| 17. | Friction is a force | | | |
|  | | **A.** | that gets stronger when two objects move away from each other. |

|  |  |  |
| --- | --- | --- |
|  | **B.** | that exists between any two objects in the universe. |

|  |  |  |
| --- | --- | --- |
|  | **C.** | that helps two objects move faster when they are touching. |

|  |  |  |
| --- | --- | --- |
|  | **D.** | that operates against motion when two objects are touching. |

Bottom of Form

