

Chapter 11 & 12 Study Guide: Motion & Forces

Chapter 11: Motion

1. Define (include the formula and circle diagram for calculating speed, velocity, and acceleration):
 - a. Distance:
 - b. Speed:
 - c. Velocity:
 - d. Acceleration:
2. What is the speed of an object at rest?
3. The difference between speed and velocity is that velocity includes
4. The SI unit for distance is
5. The SI unit for speed or velocity is
6. The SI unit for acceleration is
7. On a **distance-time** graph, what does the slope tell you?
8. On a **speed-time** graph, what does the slope tell you?
9. What is the law of conservation of energy? Give an example?

Chapter 12: Forces

10. **Describe** (what does it say and what is it commonly called)
 - a. Newton's First law of Motion:
 - b. Newton's Second law of Motion:
 - c. Newton's Third law of Motion
11. Give **an example for each** of Newton's laws
 - a. Newton's First law of Motion:
 - b. Newton's Second law of Motion
 - c. Newton's Third law of Motion:

12. **Define and give an example of each of the following terms.**

Definition	Example
a. Friction:	a. Friction:
b. Static Friction:	b. Static Friction:
c. Sliding Friction:	c. Sliding Friction:
d. Rolling Friction:	d. Rolling Friction:
e. Fluid Friction:	

f. Net force:	e. Fluid Friction: f. Net force:
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13. Can an object accelerate if there are no net forces?
14. Can an object be moving with no net force?
15. If forces are unbalanced, is there acceleration?
16. The combination of all of the forces acting on an object is called the
17. If the net force acting on a stationary object is zero, then the object will
18. A car on cruise control is an example of (balanced/unbalanced) forces.
19. When the mass of one of two objects increases, the force of gravity between the two objects
20. The law that states that every object maintains constant velocity unless acted on by an unbalanced force is
21. The law that states that for every action force there is an equal and opposite reaction force is
22. The law that states that the unbalanced force acting on an object equals the object's mass times its acceleration is
23. What is the SI unit for force?
24. When the force of air resistance balances the force of gravity of an object that is falling, velocity (increases, stays the same, decreases)? Why?

Mixed Review Calculations [show your GIVEN, EQUATION, and SOLVE]

25. What is the velocity of a missile that travels north 8000 meters in 10.12 seconds?

Given	Equation	Solve

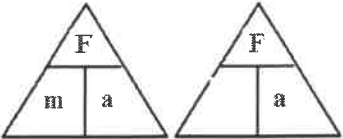
26. What distance does a rocket flying for 5 seconds at 100 m/s travel?

Given	Equation	Solve

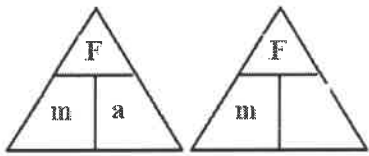
27. In 5 seconds, a car goes from 0 m/s to 60 m/s. What is the acceleration of the car?

Given	Equation	Solve

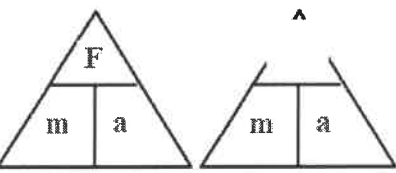
28. A car's engine produces a force of 1500 N and it accelerates at 2.5 m/s². What is its mass?

Given	Equation 	Solve
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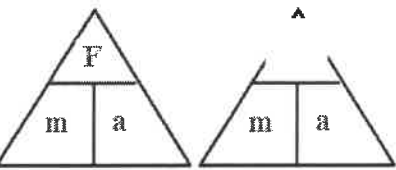
29. You throw a 0.5 kg ball with a force of 15 N. What is the ball's acceleration?

Given	Equation 	Solve
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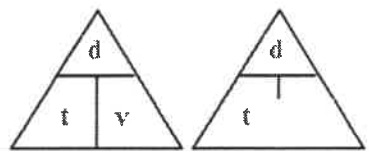
30. A 15 kg ball accelerates at 20 m/s² what force was exerted on the ball?

Given	Equation 	Solve
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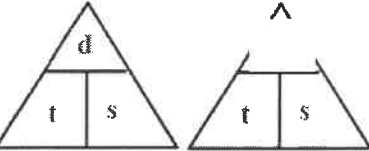
31. How much force is required to accelerate a 2 kg rock at 3 m/s²?

Given	Equation 	Solve
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32. A horse ran 500 meters down the hill in 50 seconds. What is the velocity of the horse?

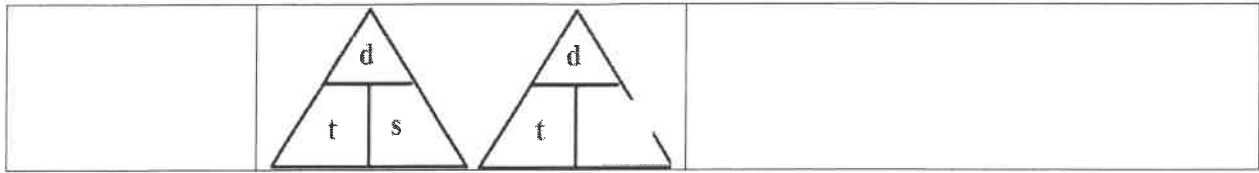
Given	Equation 	Solve
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33. Sally drove at a speed of 50 km/hr. south for 2 hours. How far did she travel?

Given	Equation 	Solve
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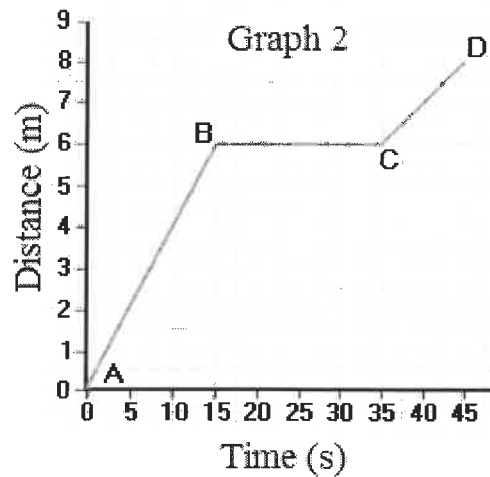
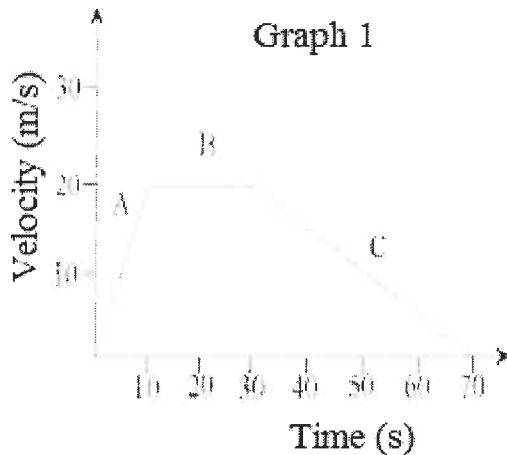
34. A hiker walked a 5 kilometer trail in 65 minutes. What was his speed?

Given	Equation	Solve
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Graphing Motion

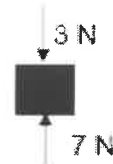
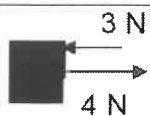
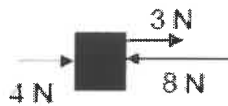
35. A horizontal line on a distance-time graph means the object is
36. An upward slope on a distance-time graph means the object is
37. A downward slope on a distance-time graph means the object is
38. A horizontal line on a speed-time graph shows that an object is
39. On a speed-time graph, a line with a negative slope indicates that the object is
40. On a speed-time graph, a line with a positive slope indicates that the object is



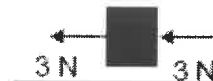
41. On Graph 1 calculate the following (**SHOW YOUR WORK with UNITS**)
 - a. Acceleration from 0 to 10 seconds.
 - b. Acceleration from 10 to 30 seconds
 - c. Acceleration from 30 to 70 seconds
42. On Graph 2 calculate the following (**SHOW YOUR WORK with UNITS**)
 - a. Find the average speed.
 - b. Find the speed from 0 to 15 seconds
 - c. Find the speed from 15 to 35 seconds.

Net Forces Find the net force acting on the following items. Be sure to include direction.

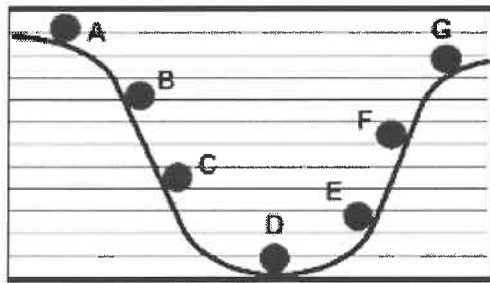
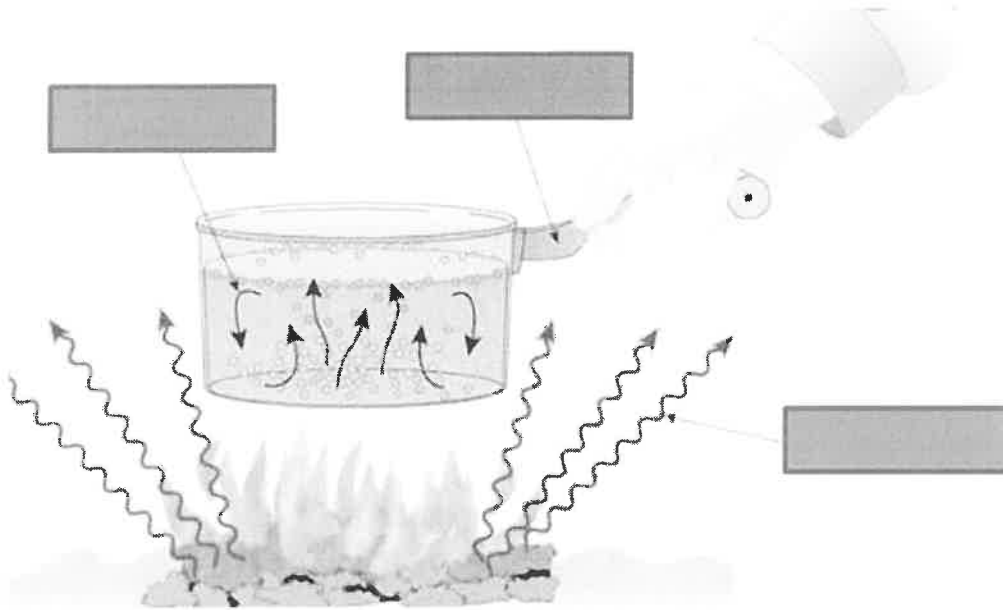
43.



45.

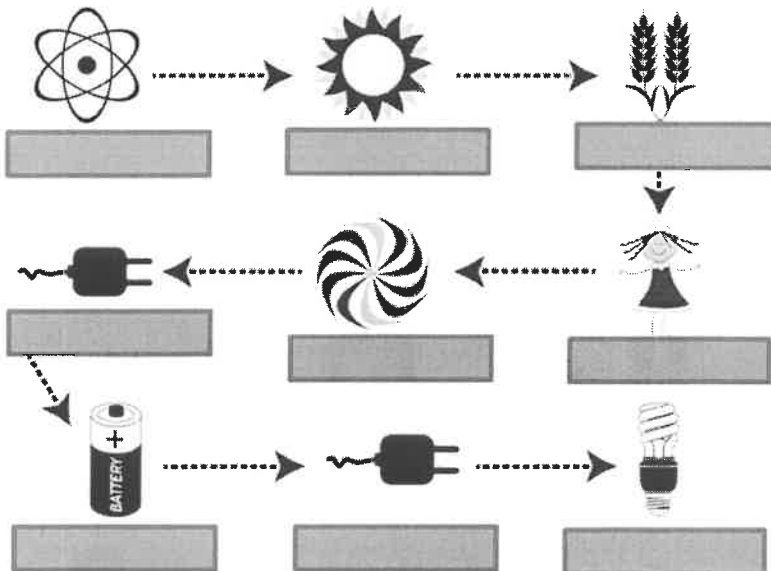


44. Label the types of heat transfer below?

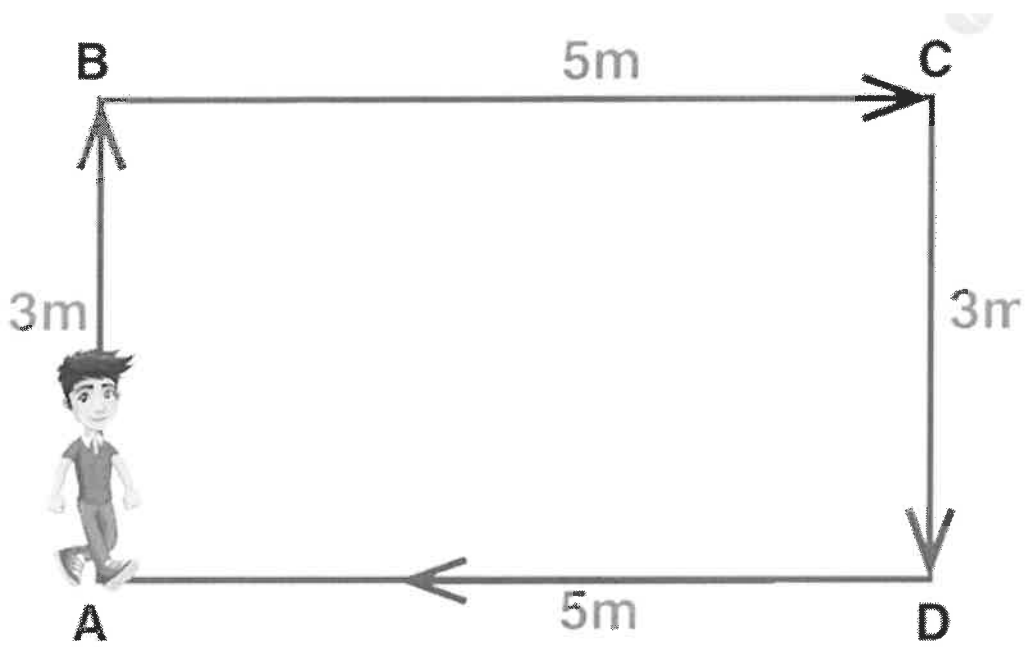


45. Which letter has the most potential energy and which letter has the most kinetic energy?

46.



Word Bank:
 (more than once)
 Chemical
 Nuclear
 Motion
 Electrical
 Radiant
 Light



47.

If you start at point A and walk back to point A what is the distance and what is the displacement?