Ch. 3 Forces and Motion Study Guide

1. How do you know when an object is in motion? _____
2. What is the difference between speed and velocity?

   _____
3. Write the formula for speed using the Triangle Method.

4. What is the formula for speed?

5. What is the formula if the question is asking you to solve for distance?

6. What is the formula if the question is asking you to solve for time?

7. How do you find average speed?

   _____
8. What are the three ways acceleration can be changed?
   a. _____
   b. _____
   c. _____
9. Negative acceleration is also known as _____.
10. What formula do you use if you are asked to find velocity?

11. What are SI Units? What is the full name?

    _____

    _____
12. What is the SI unit for length? _____
13. What do the following symbols stand for?
    a. cm = _____
    b. mm = _____
    c. m = _____
    d. Kg = _____
14. What is acceleration? _____
15. What formula would you use to find acceleration?

16. Why are pilots concerned about velocity and not just speed?

    _____

    _____
17. Suppose you are riding in a car, describe your motion relative to the car, the road, and the sun.

    _____

    _____
18. What is slope? What does slope tell you on a graph? How can you read the lines on the graph for slope and explain what they mean.

    _____

    _____
19. If an object is moving at a constant speed, how can it accelerate? Explain and give 2 examples to support your reasoning.

    _____

    _____

    _____

SHOW YOUR WORK!

20. A car traveled from St. Louis to Breese for about 5.55 hours. The distance between these two cities is 327 miles. How fast was the car traveling?

21. How long does it take for a cheetah to run 251 miles if it traveled at a speed of 65 miles per hour?

22. Trisha rode her bicycle 17 km/hr for 3.0 hours. How far did she ride?

23. A baseball pitcher throws a baseball and it accelerates until it reaches a velocity of 12 m/s after 5.1 seconds. What is the acceleration of the baseball?

24. A train is accelerating at a rate of 3.2 km/h/s. If its velocity is 45 km/h, what is its final velocity after 45 seconds?

25. James is traveling west on her bike at a velocity of 25 miles per hour. If she travels for .45 hours, how far will she go?

26. A roller coaster is moving at 53 m/s at the bottom of the hill. 7.2 seconds later it reaches the top of the next hill, moving at 18 m/s. What is the acceleration? Is it positive or negative? Why?

27. A train is accelerating at a rate of 25.2 km/hr/hr. If its initial velocity is 55 km/hr, what is its final velocity after .25 hours?

28. What are the two factors that affect the friction force between 2 surfaces?

_____

_____

29. The acceleration due to gravity of all objects in free fall is the same. Why then, do some objects fall though the air at a different rate than others?

_____

_____

30. How does mass differ from weight?

_____

_____

31. What 2 factors affect the gravitational force between 2 objects?

_____

32. What are the 4 types of friction we discussed in class?

_____

33. Which friction requires more force to overcome?

_____

34. The force that pulls objects toward each other is called _____.

35. What is friction?

_____

_____

36. Friction acts in what direction _____ to the object's direction of motion.

37. A force is a _____ or _____.

38. What is force measured in? _____

39. What is a Newton equivalent too? _____

40. If Josh and Alex are pushing a box to the right in the same direction, with each using 6 Newton's of force, what is the total net force? What direction is the force?

_____

41. What is a balanced force?

_____

42. What is an unbalanced force?

_____

_____

43. Unbalanced forces produce a _____ in motion.

44. What is Newton's 3rd Law? Give an example.

_____

_____

45. What is the momentum of a 30.0 kg dog running at a speed of 10.0 m/s?

_____

46. When solid surfaces slide over each other, the kind of friction that occurs is _____ friction.

47. The amount of matter in an object is called _____.

48. One _____ equals the force required to accelerate 1 kilogram of mass at 1 m/s^2.

49. The force of gravity on a person or object at the surface of a planet is known as _____.

50. What is Newton's 2nd Law of Motion?

_____

51. What are 2 ways to increase the acceleration of an object?

_____

_____

52. Explain Newton's 1st Law of Motion and give an example.

_____

_____

53. What does Inertia depend on? _____

54. At how fast do object's accelerate when gravity is the only force acting on them?

_____

55. What is the difference between sliding friction and fluid friction?

_____

_____

56. Explain how a parachute works. Use words such as air resistance, free fall, surface area, and gravity to explain.

_____

_____

57. Why does your weight differ between the moon and Earth, but yet your mass is always the same? Explain.

_____

_____

58. A car with a momentum of 56,000 kg · m/s is traveling on a road at 560. m/s. What would the mass of the car be?

59. A basketball with a mass of 2.50 kg is tossed at a velocity of 15.0 m/s. What would its momentum be?

60. A 10.0 kg bowling ball would require what force to accelerate it down an alleyway at a rate of 7.0 m/s^2?

61. What is the acceleration of a softball if it has a mass of 2.30 kg and hits the catcher's glove with a force of 85.0 newtons?

62. What is the mass of a truck if it is accelerating at a rate of 23.50 m/s^2 and it hits a parked car with a force of 15,460 newtons?