Name: _____

Ch. 3-4 Friction and Gravitational Interactions

Pages 150-158

1. A contact force that occurs when 2 surfaces rub against each other is known as _____.
2. Friction acts in the direction _____to the direction motion.
3. What 2 things affect friction between 2 surfaces:
    a. _____
    b. _____
4. How does tread on a tire play a part in riding a mountain bike safely?

    _____

    _____
5. Smoother surfaces produce _____ friction than rougher surfaces.
6. How does brakes on a tire help to stop a bike rider?

    _____

    _____
7. **True or False:** Without friction, a moving object will continue to move until it hits another object.
8. When an object rolls across the floor, it will experience _____ friction.
9. When 2 solid surfaces slide over each other, _____ friction occurs.
10. **True or False:** Sliding Friction is much easier to overcome than rolling friction.
11. When objects are resting on a surface, they will experience _____ friction.
12. When is there static friction between your desk chair and the floor?
    a. When the chair sits still
    b. When the chair falls to the floor
    c. When you lift the chair
    d. When you slide your chair under your desk
13. _____ friction occurs when a solid object moves through a fluid.
14. **True or False:** Air Resistance is a type of fluid friction.
15. Give a real life example of fluid friction.

    _____
16. Air, water, and oil are all considered _____.
17. Snow has been lying on a mountainside. Suddenly, it starts to move down the mountain. Explain how the following types of friction are observed in this avalanche. Where does each occur?
    a. Static Friction:

        _____

        _____
    b. Sliding Friction:

        _____

        _____
    c. Fluid Friction:

        _____

        _____
18. Gravity is an example of a _____ force.
19. What did Isaac Newton conclude in reference to gravity?

    _____

    _____
20. Gravity acts everywhere in the _____.

21. Define the Law of Universal Gravitation.

_____

_____

22. Give a reason why the gravitational attraction between any 2 objects on Earth is much smaller than the attraction between Earth and the object itself.

_____

_____

23. What 2 factors affect gravity?
    a. _____
    b. _____
24. The more mass an object has, the _____ gravitational force between it and other objects.
25. As distance _____, gravitational force decreases.
26. What is the difference between mass and weight?

_____

_____

27. What is the SI unit for weight? _____
28. The acceleration due to gravity here on Earth is _____.
29. Explain why your mass on Jupiter would be the same as on Earth, but your weight would increase 300 times?

_____

_____

30. Fill in the table below using the data and information from the Math Tool Box on top of Page 156.

Location	Earth	Moon	Mars	Jupiter
Mass (kg)				
Weight (pounds)				

31. What is gravitational potential energy?

_____

_____

32. How do you calculate gravitational potential energy?

33. A group of skydivers are riding in a helicopter up to the spot from which they will jump. As they ride upward, their gravitational potential energy _____
    a. Decreases
    b. Remains constant
    c. Increases
    d. Changes to kinetic energy
34. Explain how a skydiver falls to the ground safely using a parachute. Be sure to use the following words in your explanation: Gravity, friction, unbalanced forces, air resistance, and terminal velocity.

_____

_____

_____

35. The top speed that is reached when falling through the air and balanced forces are achieved is known as _____.