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Directions: Show all work neatly and organized, label all units as you are solving the problems, circle
final answer(s).

1.   The radius of the Earth is about 6400 km. A 7200 N spacecraft travels away from the earth. What
        would be the weight of the spacecraft at these distances from the earth's surface? (1pt ea)

        a. 6400 km

        b. 12,800 km

        c. 19,200 km

        d. 25,600 km

        e. 32,000 km

2.   The force of gravity acting on an object near the earth's surface is proportional to the mass of the
        object. Why doesn't a heavy object fall faster than a light object? (2 pts)

3.   Two 1.0-kg masses are separated by 1.0 meters. What is the force of attraction between them?
        (2 pts)

4.   Astronomers have noticed that some stars "wobble" slightly as they move through space. They
        claim that this is evidence that these stars have a planet or system of planets orbiting them.
        Explain this reasoning. (2pts)

5.   During space flight astronauts often refer to forces as multiples of the of gravity on the earth's
        surface. What would a force of "5g" mean to an astronaut? (2 pts)

6. Two people are standing 2.0 m apart. One has a mass of 80 kg, the other has a mass of 60 kg. What is the gravitational force between them? (2pts)

7. Two bowling balls each have a mass of 6.8 kg. The spheres are located next to one another with their centers 21.8 cm apart. What gravitational force do they exert on each other? (2 pts)

8. An imaginary line from a planet to the sun sweeps out equal areas in equal times. Does the planet move faster along its orbital path when it is close too, or far away from the sun? Explain. (2 pts)

9. If a small planet were located 8 times as far from the sun as the earth's distance from the sun (1.5 x 10^{11} m), how many earth years would it take the planet to orbit the sun? (6 pts)