Part 2: Finding The Force of Gravity on a Planet

6a. The earth has a radius of 6.371×10^6 m. You have a mass of 60.0 kg. Draw yourself standing on the surface of the earth, and label the distance between yourself and the center of the earth.

6b. What is the force pulling you towards the earth? [You need to look up the mass of the earth!]

Looking for	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

7a. You have a mass of 75.0 kg, and you jump off a diving board. Draw yourself falling towards the surface of the earth.

7b. Find the force pulling you towards the earth. [round as little as possible!]

Looking for	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

7c. If the only force on you were the earth's gravity, what is your acceleration towards the earth? [round to 3 significant figures]

Looking for	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

8. Suppose that you have a mass of *m* and are falling straight down on earth. Compare two formulas: Newton's Second Law and The Law of Universal Gravitation. Find your acceleration towards the earth.

For this number, rather than *a*, we call *g*.

9. Find the acceleration of something with a mass of *m* falling down on mars.
Mass of Mars = 6.39×10^{23} kg.
Radius of mars = 3390 km

10. Find the acceleration of something with a mass of *m* falling down on Jupiter.
Mass of Jupiter = 1.98×10^{27} kg
Radius of Jupiter = 69,911 km

11. Find the acceleration of something with a mass of *m* falling on Pluto.
Mass of Pluto = 1.3×10^{22} kg
Radius of Pluto = 1,184 km [Fun Fact: this is approximately the same as the distance from Boston to Charlotte, NC. Basically, a long weekend road trip. Sounds like a dwarf planet to me.]

Answers

1. 3.51×10^{-11} N

2. 2.67×10^{-10} N

3. 3.52×10^{22} N

4. 1.98×10^{20} N

5. 4.16×10^{23} N

6c. 489 N

7b. 735.77702 N

7c. 9.81 m/s^2

9. 3.71 m/s^2

10. 27.0 m/s^2

11. 0.0619 m/s^2