The Law of Universal Gravitation:
Any two masses, anywhere in the universe, are attracted to each other by this formula:

$$F_g = G\frac{m_1 m_2}{d^2}$$

Symbol	Quantity	SI Unit
F_g	Force of Gravity	Newtons
G	6.67 x 10⁻¹¹	$\dfrac{\text{N m}^2}{\text{kg}^2}$
m_1	First mass	kilograms
m_2	Second mass	kilograms
d	Distance between masses**	meters

** Actually, the difference between the centers of mass.

Part 1: Force between objects in space

1. Imagine two baseballs near each other in space. Each baseball has a mass of .145 kg. Their centers are 0.200 m apart. What is the force between the baseballs?

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

2. Imagine two bowling balls near each other in space. Each bowling ball has a mass of 6.00 kg. The centers of the bowling balls are 3.00 meters apart. What is the gravitational force between the bowling balls?

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

3. Mass of the earth = 5.97 x 10^{24} kg
Mass of the sun = 1.99 x 10^{30} kg
Distance earth to sun = 1.50 x 10^{11} m
What is the gravitational force between the sun and the earth?

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

4a. Distance earth to moon =3.84 x 10^8 meters.
Mass of the moon = 7.35 x 10^{22}
What is the gravitational force between the earth and the moon?

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

5a. Distance from Jupiter to the Sun = 7.79 x 10^{11} m

Mass of Jupiter = 1.90 x 10^{27} kg

What is the force of gravitational attraction between the Sun and Jupiter?

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