

$$m_{\text{Earth}} = 5.98 \times 10^{24} \text{ kg} \quad m_{\text{Moon}} = 7.35 \times 10^{22} \text{ kg}$$

Worksheet 5.3

1) Two students are sitting 1.50 m apart. One student has a mass of 70.0 kg and the other has a mass of 52.0 kg. What is the gravitational force between them? (1.08x10⁻⁷ N)

2) What gravitational force does the moon produce on the Earth if their centers are 3.84x10⁸ m apart? (1.99x10²⁰ N)

3) if the gravitational force between two objects of equal mass is 2.30x10⁻⁸ N when the objects are 10.0 m apart what is the mass of each object? (186 kg)

4) Calculate the gravitational force on a 6.50x10² kg spacecraft that is 4.15x10⁶ m above the surface of the Earth. (2.34x10³ N)

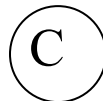
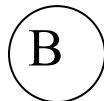
5) The gravitational force between two objects that are 2.1x10⁻¹ m apart is 3.2x10⁻⁶ N. If the mass of one object is 55 kg, what is the mass of the other object? (38 kg)

6) If two objects, each with a mass of 200 kg, produce a gravitational force of 3.7x10⁻⁶ N, what is the distance between them? (0.85 m)

7) What is the gravitational force on a 70.0 kg object standing on the Earth's surface? (686 N)

8) Three 10.0 kg objects are placed in a straight line 5.00x10⁻¹ m apart. What is the net gravitational force on the center object due to the other two objects? (0N)

9) Three objects A, B, and C are placed 0.50 m apart along a straight line. A and B have masses of 10.0 kg and C has a mass of 15.0 kg, what is the net gravitational force on B due to A and C? (1.33x10⁻⁸ N)



10) The force of gravity between two small masses A and B when placed very near each other is 3.24x10⁻⁷ N. What will the force between these objects be if both of their masses are doubled and the distance between them is tripled? (1.44x10⁻⁷ N)