

You and a friend go out for pizza. There are two options at the same price. You can each get an 8" pizza, or you can split (evenly!) a 12" pizza. Which is the better buy (more pizza per dollar)?

1. Two 8-inch pizzas
2. One 12-inch pizza
3. Same value
4. No way to tell!

10 inches



$$\text{Area small} = \pi(5'')^2 = 78.54 \text{ in}^2$$

16 inches



$$\text{Area large} = \pi(8'')^2 = 201.1 \text{ in}^2$$

$$\text{ratio} = 78.54 \text{ in}^2 / 201.1 \text{ in}^2 = 2.56$$

Or the easier method:

$$\text{Area large} / \text{Area small} = (\text{diameter large} / \text{diameter small})^2 = (16/10)^2 = 256/100 = 2.56$$

The Moon does not fall toward the Earth because

1. it has own gravitational field.
2. the net force on it is zero.
3. it is beyond the main pull of Earth's gravity.
4. it is being pulled by the Sun and other planets as well as by Earth.
5. all of the above
6. none of the above

The force of gravity provides the centripetal acceleration that makes a satellite orbit the earth.

How does the orbital speed differ for two satellites at the same altitude but with different masses? The heavier satellite orbits

1. faster

2. slower

3. same speed

Two satellites of the same mass are going around Earth in concentric circular orbits. The distance of one satellite from Earth's center is twice that of the other satellite. What is the ratio of the centripetal acceleration of the farther satellite to that of the closer one?

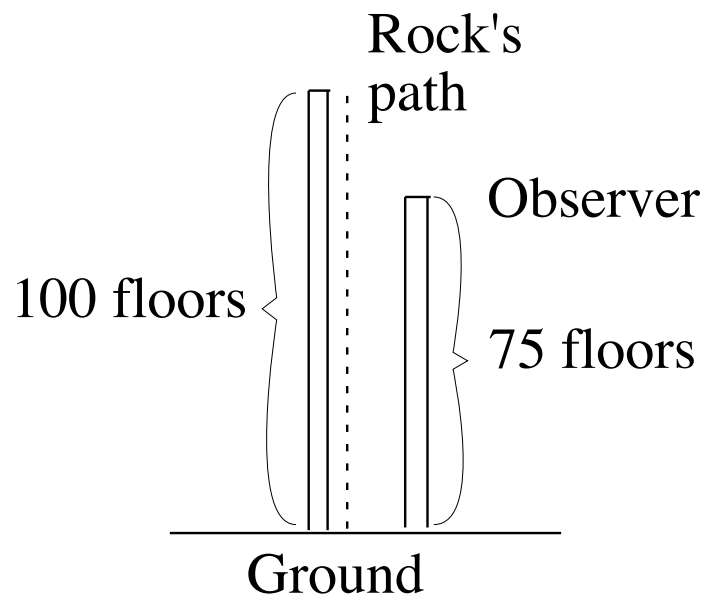
1.  $1/8$
2.  $1/4$
3.  $1/2$
4.  $1/\sqrt{2}$
5. 1

Two satellites of the same mass are going around Earth in concentric circular orbits. The distance of one satellite from Earth's center is twice that of the other satellite. What is the ratio of the linear speed of the farther satellite to that of the closer one?

1.  $1/8$
2.  $1/4$
3.  $1/2$
4.  $1/\sqrt{2}$
5. 1

A rock falls from rest from the 100<sup>th</sup> floor of a building. An observer top a neighboring 75-story building measures the rock's speed as it passes. Neglecting air resistance, the speed when it hits the ground is

1. the same as
2. twice
3. three times
4. four times
5. eight times
6. nine times
7. sixteen times



its speed when it passed the 75<sup>th</sup> floor.

A rock falls from rest from infinitely far away from the Earth. An observer in a passing satellite measures the rock's speed toward the Earth as it passes. Neglecting air resistance, the speed when it hits the ground is

1. the same as
2. twice
3. three times
4. four times
5. eight times
6. nine times
7. sixteen times

its speed when it passed the observer.

