Pre-Calculus
Mixed Practice Applications - Quadratic and Power Functions

1. A rectangle has a length 5 inches more than the width. The area of the rectangle is 104 square inches. What are the dimensions of the rectangle?

2. The weight of a body varies inversely as the square of its distance from the center of the earth. If the radius of the earth is 4000 miles, how much would a 200-pound man weight 1000 miles above the surface of the earth?

3. The Pine City's Evergreen Park has a rectangular rose garden with dimensions 20 feet by 28 feet. It is surrounded by a sidewalk of uniform width. If the total area of the garden and the sidewalk is 1008 square feet, find the width of the sidewalk.

4. A farmer will make a rectangular pen with 100 feet of fence using part of his barn for one side of the pen. What is the largest area he can enclose?

5. Television screens are usually measured by the length of the diagonal. If a television screen has a 60 inch diagonal and the screen is 12 inches wider than it is high, find the dimensions of the screen.

6. An object is launched from ground level directly upward at 39.2 m/s. For how long is the object at or above a height of 34.3 meters?

7. In science, one theory of life expectancy states that the lifespan of mammals varies inversely to the number of heartbeats per minute of the animal. If a gerbil's heart beats 360 times per minute and lives an average of 3.5 years, what would be the life expectancy of a human with an average of 72 beats per minute?

8. According to Hooke's Law, the force needed to stretch a spring is proportional to the amount the spring is stretched. If fifty pounds of force stretches a spring five inches, how much will the spring be stretched by a force of 120 pounds?

9. An object is launched at 19.6 meters per second (m/s) from a 58.8-meter tall platform. When does the object strike the ground?

10. Kepler's third law of planetary motion states that the square of the time required for a planet to make one revolution about the sun varies directly as the cube of the average distance of the planet from the sun. If you assume that Mars is 1.5 times as far from the sun as is the earth, find the approximate length of a Martian year.

Answers:

1. 8 in by 13 in

2. 128 lbs

3. 4 ft

4. 1250 ft^2

5. 36 in by 48 in

6. 6 sec

7. 17.5 years

8. 12 in

9. 6 sec

10. ~670.547 days