

Pre-Calculus

Polynomial Word Problems

1. When there are 22 apple trees per acre, the average yield has been found to be 500 apples per tree. For each additional tree planted per acre, the yield per tree decreases by 15 apples per tree. How many additional trees per acre should be planted to maximize the yield?
2. A box has a volume of 1,800 cubic cm. The length is 6 times the height. As well, the length is 18 cm longer than the width. If the length is increased by 2 cm, the width by 3 cm and the height by 4 cm, the volume becomes 4,320 cubic cm. What is the original length of the box in cm?
3. A catering company is designing a box. The volume box is to be 54 cubic inches and the bottom of the box to be a square. Suppose the bottom of the box has a width that is 3 inches smaller than the height x of the box. Write a polynomial equation of the box.
4. The Seahawks play in Century Link Field with a seating capacity of 67,000. When ticket prices average \$300, games are sold out. A market survey indicates that for \$25 dollar increase in ticket price, the average attendance decreases by 1750. Write an equation that models the situation. Find the ticket price that maximizes revenue from ticket sales.
5. A rectangular piece of cardboard is 15 inches longer than it is wide. If 5-inch squares are cut from each corner, and the remaining piece folded up to form a box, the volume of the box is 1250 cubic inches. Find the dimensions of the piece of cardboard.
6. A storage company needs to design a new storage box that has twice the volume of its largest box. Its largest box is 5 ft. long, 4 ft. wide and 3 ft. high. The new box must be formed by increasing each dimension by the same amount. Find the increase in each dimension.
7. The design of a digital camera box maximizes the volume while keeping the sum of the dimensions at 6 inches. If the length must be 1.5 inches times the height, what should each dimension be?