

Math 135: Intermediate Algebra

Worksheet 5

Nov 1, 2007

1. One often needs to multiply polynomials in problems involving areas and volumes.
 - (a) The length of a rectangular field is 10 meters more than twice the width. Let w be the width. What is the area of the field?
 - (b) A triangular roof panel has a height half as long as its base. If the base has length b , what is the area of the roof panel.
 - (c) A rectangular block has a width 5 meters shorter than three times its length. The height is 3 times the length. If the width of the block is w , what is its volume?
 - (d) A silo is in the shape of a cylinder with a hemispherical top. The radius of the silo is one third of its height. If the height is h , find the volume of the silo.
2. Bill Gates goes insane and offers you that on the first day of the month he will give you 1 dollar, on the second day f dollars, and the third day f^2 dollars, on the fourth day f^3 dollars, and so on, increasing by a factor of f every day until the end of the month.
 - (a) The amount of money you have collected after d days is given by the formula

$$\frac{1 - f^d}{1 - f}. \tag{1}$$

Verify that this formula works after 2 days, 4 days, and 6 days using $f = 2$, i.e. assuming that the amount he gives you doubles every day.

- (b) Use synthetic division to rewrite the formula for $d = 4$ days. Check that your result agrees with your answer to part (a) for $f = 2$.
 - (c) Use synthetic division to rewrite the formula for $d = 6$. Again, check against your answer to part (a).
3. A box has a length 10 cm less than twice its width. If the width is w cm and the volume of the box is $2w^3 - 20w^2 + 50w$ cm³, then:
 - (a) Use synthetic division to find the height of the box in terms of w .
 - (b) What is the area of the base of the box?
 - (c) What are the areas of the box sides?
 - (d) Find the the volume of a box whose with the same length and width, but twice the height.