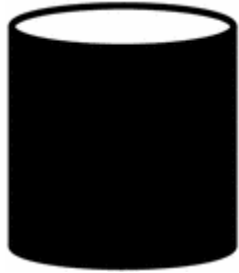# Making Hay While the Sun Shines
&
Not Losing It in the Rain

(The Geometry of the Big Round Bale)

height

base

1. If the diameter of the bale is 6 ft. and the height is 5 ft., determine the volume of the bale. (**include units**)

    _____

2. The net wrap goes around the lateral surface of the bale. Therefore we are going to consider the deterioration of the lateral surface only. Find the usable volume if the outer 6 in. all the way around the bale spoils due to weather. (**include units**)

    _____

3. Determine how much hay is lost from spoilage. (**include units**)   _____

4. Determine what percent of the hay spoiled.   _____

5. Were you surprised at the percent that spoiled?   _____

6. Does changing the radius or the height affect the volume of the   _____
    cylinder the most?

7. Discuss what you think the reason might be for your answer to #6.

    _____

8. Adjust the radius to 2.5 ft. Does the percent loss agree with your answer to #4? _____
    If not, recalculate #1 – 4.

9. Cut the radius in half, from 3 ft. to 1.5 ft. What percent was lost?   _____

10. Approximately what is the radius of the bale when there is a 50% loss? _____

11. For what other reasons might the farmer want to compute the volume of the hay bale or be concerned with the percent of loss in the smaller bale?

    _____

Extension Questions: Collecting Data in a Spreadsheet and Displaying it in a Graph

12. Does the volume increase at a constant rate with respect to the radius?   _____

13. Explain your answer to #12 with respect to the graph on page 1.4.

    _____

14. What type of function might we use to model the data on page 1.4?   _____

15. Does the percent of volume lost decrease at a constant rate with respect to the radius? _____

16. Explain your answer to #14 with respect to the graph on page 1.5.

    _____

17. What type of function might we use to model the data on page 1.5?   _____

18. What exact function did you find to model the data on page 1.4?   _____

19. What exact function did you find to model the data on page 1.5?   _____

20. Explain the transformations you see in the graph on page 1.5 in relation to your function.
    i.e. Explain the y-intercept & vertical stretches or flips in relation to the graph & data.

    _____

    _____