North Dakota Department of Environmental Quality
Division of Waste Management

Landfill Operator Training
Math Workbook

January 26 – January 28, 2021

NORTH Dakota | Environmental Quality

Be Legendary.™

Formulas and Conversions:

Slope:

- Ratio = Run:Rise
- $\text{Percentage} = \frac{\text{Rise}}{\text{Run}} \times 100$

Converting from % slope to ratio: $\frac{100}{\%} = Run : 1$

Converting from ration to % slope: $\frac{100}{\text{Run}} = \%$

Area and Volume:

Area = Length x Width

1 acre = 43,560 ft.^{2}

Volume = Length x Width x Height

1 yd.^{3} = 27 ft.^{3}

Math

Contour Example #1: What is the elevation of the top of the slope?

Given contour line: _____ feet, Contour Interval: _____ feet

Elevation: _____ feet

Contour Example #2: On plan sheet 3, what is the maximum final height of the fill area?

Elevation: _____ feet

Example: How many feet are in 60 inches?

Area Example #1: What is the area of this rectangle?

Area = Length x width

Area = _____ft. x _____ft.

Area = _____ $ft.^2$

Area Example #1 to Acres: Convert area in example #1 to acres?

1 acre = 43560 sq. ft.

Volume Example #1: Calculate the volume of one cubic yard?

1 yard = 3 ft.

Volume = Length x width x height

Volume = 1 yard x 1 yard x 1 yard

Volume = 3 ft x 3 ft x 3 ft

Volume = _____ $ft.^3$

Slope: Expressed as a ratio = Run:Rise

Expressed as a percentage = $\frac{\text{Rise}}{\text{Run}} \times 100$

Slope Conversions:

Percentage to Ratio:

8 %

2%

30%

Ratio to Percentage:

4:1

10:1

100:1

More Problems: Calculating with two variables

Ex. #1: How much electricity, in kW, does your computer use per month if you leave your computer on for 9 hours each day. You know your computer uses .50 kW every hour that it is turned on. Your computer is turned on an average of 23 days each month.

Problem #1: What is the fuel efficiency of your car in miles per gallon if you buy 2 tanks of gas every week? The fuel capacity of the tank is 13.5 gallons and you average 1000 miles per week.