

**North Dakota Department of Environmental Quality
Division of Waste Management**



**Landfill Operator Training
Math Workbook**

January 26 – January 28, 2021



Formulas and Conversions:

Slope:

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

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

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?

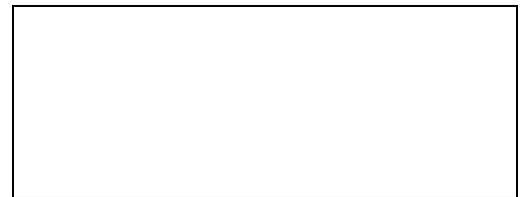
Area Example #1: What is the area of this rectangle?

Area = Length x width

Area = _____ ft. x _____ ft.

Area = _____ ft.²

500 ft.



1500 ft.

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?

$$1 \text{ yard} = 3 \text{ ft.}$$

$$\text{Volume} = \text{Length} \times \text{width} \times \text{height}$$

$$\text{Volume} = 1 \text{ yard} \times 1 \text{ yard} \times 1 \text{ yard}$$

$$\text{Volume} = 3 \text{ ft} \times 3 \text{ ft} \times 3 \text{ ft}$$

$$\text{Volume} = \underline{\hspace{2cm}} \text{ ft.}^3$$

Slope: Expressed as a ratio = Run:Rise

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

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.