

You may have heard the words pitch, slant, or steepness. These are all words to describe **slope**. Slope is the ratio that compares the change in a vertical distance to the change in a horizontal distance.

Slope is usually written as a fraction and can be expressed as follows:

$$\text{slope} = \frac{\Delta \text{ Vertical Distance}}{\Delta \text{ Horizontal Distance}}$$

" Δ " just means
"change in"

In most cases the variable m is used to represent slope. The change in vertical distance is called the rise, and the change in horizontal distance is called the run. This means that we can express slope more easily as:

$$m = \frac{\text{RISE}}{\text{RUN}}$$

In many trades, calculating the slope is necessary in order to ensure that designs meet building codes and have structural integrity. For example, the building code states that decks must slope $\frac{1}{4}$ of an inch for every 12 feet of deck to drain water away from the building.

Ex. #1) A contractor may be asked to build a ramp to make a house wheelchair accessible. Why would it be necessary to calculate the correct slope for a wheelchair ramp?

- If the slope is too steep it would make it difficult & dangerous to wheel up or down.
- If slope is too shallow it might take up too much horizontal space.
- etc.



Ex. #2) Calculate the slope of a line that has a rise of 12 cm for a run of 8 cm.

$$m = \frac{\text{Rise}}{\text{Run}} = \frac{12 \text{ cm}}{8 \text{ cm}} = \frac{6 \div 2}{4 \div 2} = \frac{3}{2}$$

The slope is
 $\frac{3}{2}$

Ex. #3) A water slide covers 4.2 m of ground (horizontally) and is 1.8 m tall. Calculate the slope.

$$m = \frac{\text{Rise}}{\text{Run}} = \frac{1.8 \text{ m}}{4.2 \text{ m}} = \frac{18 \div 6}{42 \div 6} = \frac{3}{7}$$

x 10 to get rid of decimals

The slide has
a slope of $\frac{3}{7}$