*Defn* The ***slope, m,*** *of a non-vertical line passing through* $\left(x\_{1},y\_{1}\right) \& (x\_{2},y\_{2})$ *is defined to be*

$$m=\frac{∆y}{∆x}=\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}=\frac{y\_{1}-y\_{2}}{x\_{1}-x\_{2}} where x\_{1}\ne x\_{2}$$

 *The slope of a vertical line is undefined.*

*Circle the correct choice of T or F for one point, state why it is, for the rest of the points.*

T/F Two similar right triangles will have the same slope?

T/F Two right triangles with the same slope will be similar?

## Equations of a line:

1. Point-Slope form of a line: Most useful with a point and a given slope or two points.

$$y-y\_{1}=m(x-x\_{1})$$

1. Slope-intercept form of a line: Most useful with a given slope and the y-intercept

$$y=mx+b$$

1. Standard form of a line:

$ax+by=c$ Slope will be $m=–\frac{a}{b}$, and y-int will be $(0,\frac{c}{b})$

1. Vertical line:

$x=c$ where c is a constant

1. Horizontal line:

$y=c$ where c is a constant

Parallel lines: Definition is simply that two lines are parallel if they never touch. In Euclidean geometry, parallel lines will have the same slope.

For our purposes, Perpendicular lines are two lines that meet at 90$°$. The slopes of two perpendicular lines will be negative reciprocals of each other.

$$m=-\frac{1}{m\_{⊥}}$$

## Rates of Change:

 The rate of change of something is a quotient of two things relative to each other, like distance over time. This is an example of the rate of change, because it tells speed (miles per hour).

 Rate of change is simply a ratio of two different quantities. Notice that slope is identical to a rate of change. It is the ratio of the change in y height over the change in x distance. It turns out that, slope, or rate of change, will be the first fundamental foundation block for our study of calculus so know your lines and slopes!