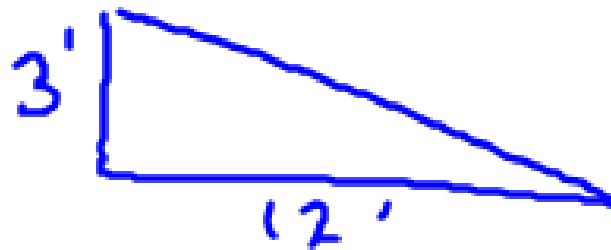


Yesterday we reviewed how to calculate slope.

8. Cole bought a piano. The delivery truck has a ramp so the piano can be easily taken off the truck. The distance from the top of the ramp to the ground is 3 ft. The ramp reaches 12 ft on the ground from the back of the truck. What is the slope of the ramp?



$$\begin{aligned}\text{Slope} &= \frac{\text{Rise}}{\text{Run}} \\ &= \frac{3 \text{ ft}}{12 \text{ ft}} \div 3 \\ &= \frac{1}{4}\end{aligned}$$

9. Kara and Amy are planning a ski trip to Skier's Paradise. They check the website and see the following table.

		<i>Run</i>	<i>Rise</i>
	Ski Run	Horizontal Distance	Vertical Distance
<i>S</i>	Skier's Surprise	1576 m	519 m
<i>R</i>	Rigorous Run	419 m	220 m
<i>M</i>	Magic Mountain	231 m	95 m
<i>B</i>	Bunny Slope Express	87 m	28 m

- a) Calculate the slope of each run. Express each answer as a decimal to the nearest hundredth.
- b) Kara is an avid skier. Which run should she choose? Why?
- c) Amy has only skied once before and is a little nervous about skiing. Which run should she choose? Why?

$$m_S = \frac{519}{1576} \\ = 0.33$$

$$m_R = \frac{220}{419} \\ = 0.53$$

$$m_M = \frac{95}{231}$$

$$m_B = \frac{28}{87} \\ = 0.32$$

(b) Rigorous Run because it has the greatest slope.

(c) Bunny Slope because smallest slope.

## Solve a Problem Involving Slope

Matt's backyard has been flooding, so he decides to install a drainage pipe. Matt learns that the pipe needs to drop  $\frac{1}{4}$  inch per 1-foot length.



- What does it mean that the pipe drops  $\frac{1}{4}$  inch per 1-foot length?
- What is the slope of the pipe?
- For a horizontal run of 100 ft, how much lower should one end of the pipe be than the other? Express the answer in feet and inches.

(a) For every foot horizontally, pipe drops  $\frac{1}{4}$  inch vertically.

(b) Slope is  $\frac{1}{48}$

(b)

$$\text{Rise} = \frac{1}{4} \text{ in.}$$

$$\begin{aligned} \text{Run} &= 1 \text{ ft} \\ &= 12 \text{ in} \end{aligned}$$

$$\begin{aligned} \text{Slope} &= \frac{\text{Rise}}{\text{Run}} \\ &= \frac{\frac{1}{4} \text{ in}}{12 \text{ in}} \quad \times 4 \\ &= \frac{1}{48} \end{aligned}$$

- c) For a horizontal run of 100 ft, how much lower should one end of the pipe be than the other? Express the answer in feet and inches.

$$\text{Slope} = \frac{1}{48}$$

$$\text{rise} = x$$

$$\text{run} = 100 \text{ ft}$$

$$\frac{1}{12} \text{ ft} = 1 \text{ in}$$

$$\text{Slope} = \frac{\text{rise}}{\text{run}}$$

$$\frac{1}{48} = \frac{x}{100 \text{ ft}}$$

$$\frac{100 \text{ ft}}{48} = \frac{48x}{48}$$

$$x = \frac{100}{48} \text{ ft}$$

$$x = \frac{50}{24} \text{ ft}$$

$$x = \frac{25}{12} \text{ ft}$$

$$x = \frac{24}{12} + \frac{1}{12}$$

$$x = 2 \text{ ft} + \frac{1}{12} \text{ ft}$$

$$x = 2 \text{ ft } 1 \text{ in}$$

Pipe drops 2 feet, 1 inch.

Matt's backyard has been flooding, so he decides to install a drainage pipe. Matt learns that the pipe needs to drop  $\frac{1}{4}$  inch per 1-foot length.

What if Matt wants to run his drainage pipe a horizontal distance of 200 feet? What will be the vertical drop?

$$\text{Slope} = \frac{1}{48}$$

$$\text{run} = 200$$

$$\text{rise} = x$$

$$\frac{1}{6} \text{ ft} \times 12 \\ = 2 \text{ in}$$

$$\text{Slope} = \frac{\text{rise}}{\text{run}}$$

$$\frac{1}{48} = \frac{x}{200}$$

$$\frac{200}{48} = \frac{48x}{48}$$

$$x = \frac{200}{48} \div 2$$

$$x = \frac{100}{24} \div 2$$

$$x = \frac{50}{12}$$

$$x = 2\frac{5}{6} \text{ ft} \\ x = 4\frac{1}{6} \text{ ft} \\ \text{Rise} = 4'2''$$

OR

$$x = 4\frac{2}{12} \text{ ft} \\ x = 4'2'' \\ \text{Rise} = 4'2''$$

Pipe drops 4 ft,  
2 in.

Example: Using conversions in slope questions.

a) A skateboard ramp has vertical height 16 inches, and horizontal length 3 feet. What is the slope of the ramp?

$$\text{Rise} = 16 \text{ in}$$

$$\text{Run} = 3 \text{ ft} \\ = 36 \text{ in}$$

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}}$$

$$\text{Slope} = \frac{16 \text{ in} \div 2}{36 \text{ in} \div 2}$$

$$\text{Slope} = \frac{8 \div 2}{18 \div 2}$$

$$\text{Slope} = \frac{4}{9}$$

b) A bike ramp has vertical height 80 cm and horizontal length 2.4 m. What is the slope of the ramp?

$$\text{Rise} = 80 \text{ cm}$$

$$\text{Run} = 2.4 \text{ m} = 240 \text{ cm}$$

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}}$$

$$\text{Slope} = \frac{80 \text{ cm} \div 10}{240 \text{ cm} \div 10}$$

$$\text{Slope} = \frac{8 \div 8}{24 \div 8}$$

$$\text{Slope} = \frac{1}{3}$$

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