10/9/Notes

Lesson 9: Percent Slope

SPECIFIC OBJECTIVES

By the end of this lesson, you will understand that

- % slope, pitch per foot and total fall are related quantities

By the end of this lesson, you will be able to

- Given one item (% slope or pitch per foot or total fall) calculate the other two

Definitions:

- Percent Grade (a.k.a. % Slope) : How much slope/incline in the material over the entire length. Textbook: % grade is slope as a % $\frac{\text{rise}}{\text{run}}$ Divide
- Pitch per foot : the level of incline. amount of rise or fall in one foot of run
- Total fall

  total change in elevation from highest to lowest point

Problem Situation #1 : Investigating Pitch per Foot

You are given a set of plans that have a pitch per foot of ¼" for a section of concrete. Determine the total fall for the following lengths of concrete (aside: the minimum fall for any sidewalk, by code, is ¼" per foot):

1. For one foot of sidewalk, what is the total fall? Be sure to show your calculations along with your answer.

   $\frac{1}{4}$ "

2. For ten feet of sidewalk, what is the total fall? Be sure to show your calculations along with your answer.

   $10 \text{ feet} \times \frac{1}{4}\text{"}/\text{foot} = 2\frac{1}{2} \text{ inches}$

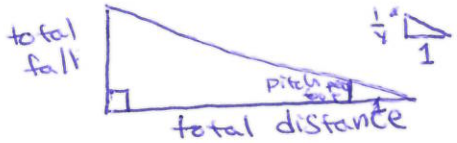
Lesson 7: Percent Slope

3. For 25 feet of sidewalk, what is the total fall? Be sure to show your calculations along with your answer.

$\frac{1}{4}$" / ~~foot~~ $\times$ 25 ~~feet~~ = $6\frac{1}{4}$ inches

4. Explain or show how 'pitch per foot' connects to 'total fall.'

pitch per foot * total distance in feet = total fall in inches



$\frac{1}{4}$" / 1 Similar triangle $\frac{1/4"}{1\,ft} = \frac{?"}{25\,ft}$

5. Now, using your definition for % slope (Percent Grade), what is the % slope for the 25' length sidewalk? Be sure to show your calculations along with your answer.

$\frac{6\frac{1}{4}"}{25'} = 0.0208 \times 100 = 2.08\%$

6. What is the % slope for the 1' length? Be sure to show your calculations along with your answer.

$\frac{\frac{1}{4}"}{1'} = 0.0208 \times 100 = 2.08\%$

7. Explain or show how the % slope connects the pitch per foot?

They are the same thing! % slope is doing the division.

$\%\ slope = \frac{x\ feet}{1\ foot}$ ← convert to inches

Problem Situation #2 : Forming Up a Sidewalk: Given % Grade

You are a carpenter on a flatwork crew that is tasked with placing a sidewalk. Your crew lead has given you the following information: The total length for the section of sidewalk you need to form up is 50 feet with a required 2% grade.

8. What is the total fall of the sidewalk for that 50'? Be sure to show your calculations along with your answer.