Bellwork •
4.3a SLOPE CONJECTURE

Objectives:

1. Define the slope of a line
2. Discover formula for finding the slope of a line.
Slope

• Slope means

• rise over run  \underline{rise}  \underline{run}

• Slope is how much a line rises compared to how much it runs.
Slope

• Think of some activities or structures that involve the word slope.

• Skiing, Stairway, etc.
Notice the Stair Step effect

Slope is how much a line rises compared to how much it runs.

This line rises 1 and runs -1.

Slope = \frac{\text{rise}}{\text{run}} = \frac{1}{-1}
The Slope Formula

- Any two points on a line can be labeled \((x_1, y_1)\) and \((x_2, y_2)\) so...

Label the 2 Points ~ let one point be \((x_1, y_1)\) and another point be \((x_2, y_2)\)
The Slope Formula

The formula is:

$\frac{y_2 - y_1}{x_2 - x_1}$
Label the 2 Points

(-1,5) = (x_1, y_1)

(2,2) = (x_2, y_2)
Using the Formula

• Let (-1,5) be \((x_1, y_1)\) and (2,2) be \((x_2, y_2)\)

so...

\[
\frac{2-5}{2-(-1)} = \frac{-3}{3} = -1
\]

The Slope Formula

• The formula is

\[
\frac{y_2 - y_1}{x_2 - x_1}
\]
Notice the Stair Step effect

Slope = -1
Calculate the slope of this line.
Calculate the slope of this line.

\[ \frac{y_2 - y_1}{x_2 - x_1} \]
The Slope Formula

• The formula is

\[
\frac{y_2 - y_1}{x_2 - x_1}
\]

The slope of this line is:

\[
\frac{2(rise)}{5(run)}
\]

Points:

1. \((0, 0)\)
2. \((5, 2)\)
3. \((x_1, y_1)\)
4. \((x_2, y_2)\)
The slope is: \( \frac{2}{5} \)

Go up 2.

Go right 5.
Calculate the slope of this line.

Points: (-3, -4), (-5, 3)
The Slope Formula

- The formula is:
  \[
  \frac{y_2 - y_1}{x_2 - x_1}
  \]

The slope of this line is:

\[
\frac{-4 - 3}{-3 - (-5)} = \frac{-7}{2}
\]
Positive and Negative Slopes

- Lines with negative slopes go down (decrease) from left to right.
This line goes down from left to right. \( m = -\frac{7}{2} \)
Positive and Negative Slopes

• Lines with positive slopes go up (increase) from left to right.
This line increases from left to right. $m = \frac{2}{5}$
Horizontal and Vertical Lines

- Horizontal lines have a slope of 0.

- Vertical lines have NO Slope
Horizontal Lines

Slope = 0
Vertical Lines

No Slope
Classwork

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