

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Introduction



Today's Lesson

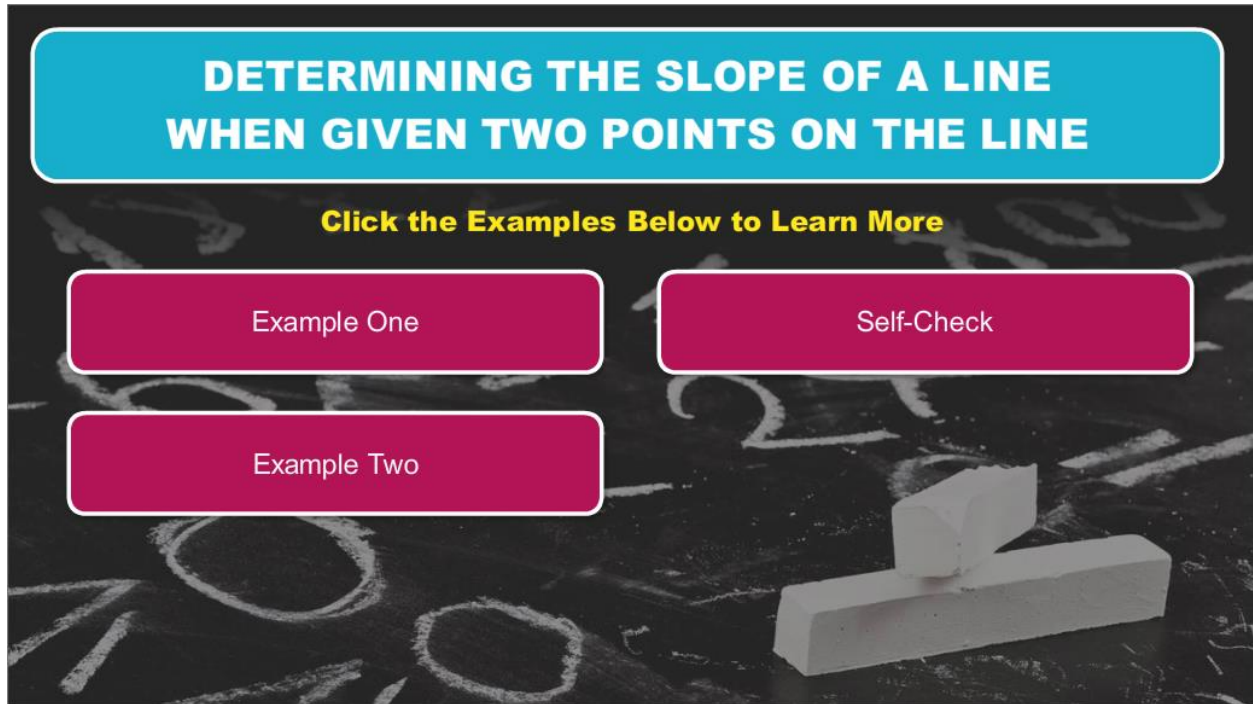
- You will learn how to use the slope formula to determine the slope of a line when given the coordinates of two points on the line.

Hi there! I'm so glad to have you here for this lesson in Algebra I, where you will learn how to use the slope formula to determine the slope of a line when given the coordinates of two points on the line.

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Determining the Slope of a Line When Given Two Points on the Line



The graphic features a dark background with faint chalkboard markings. At the top, a blue rounded rectangle contains the title "DETERMINING THE SLOPE OF A LINE WHEN GIVEN TWO POINTS ON THE LINE" in white, bold, uppercase letters. Below this, a yellow text prompt reads "Click the Examples Below to Learn More". Three pink rounded rectangular buttons are arranged: "Example One" and "Self-Check" are in the top row, and "Example Two" is centered below them. In the bottom right corner, there is a 3D rendering of a white rectangular prism with a smaller white cube on top of it.

Click the examples below to learn more.

- [Example One](#)
- [Example Two](#)
- [Self-Check](#)

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Example One

EXAMPLE 1

Find the slope of the line that passes through the points $(1, -3)$ and $(5, 1)$.

Slope Formula

Given a line that passes through the points (x_1, y_1) and (x_2, y_2) , the

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

Find the slope of the line that passes through the points $(1, -3)$ and $(5, 1)$.

Given a line that passes through the points (x_1, y_1) and (x_2, y_2) , the $\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$.

$$\text{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Example One (continued)

EXAMPLE 1

Find the slope of the line that passes through the points $(1, -3)$ and $(5, 1)$.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} & (x_1 - y_1) &= (1, -3) \\ & & (x_2 - y_2) &= (5, 1) \\ &= \frac{1 - (-3)}{5 - 1} \end{aligned}$$

Find the slope of the line that passes through the points $(1, -3)$ and $(5, 1)$.

For this example, let $(x_1, y_1) = (1, -3)$ and $(x_2, y_2) = (5, 1)$. Then, substitute the appropriate values in the slope formula: y_2 is 1, y_1 is -3 , x_2 is 5, and x_1 is 1.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} & (x_1 - y_1) &= (1, -3) \\ &= \frac{1 - (-3)}{5 - 1} & (x_2 - y_2) &= (5, 1) \end{aligned}$$

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Example One (continued)

EXAMPLE 1

Find the slope of the line that passes through the points $(1, -3)$ and $(5, 1)$.

$$\begin{aligned}m &= \frac{y_2 - y_1}{x_2 - x_1} & (x_1 - y_1) &= (1, -3) \\ & & (x_2 - y_2) &= (5, 1) \\ &= \frac{1 - (-3)}{5 - 1} \\ &= \frac{4}{4} \\ &= 1\end{aligned}$$

Find the slope of the line that passes through the points $(1, -3)$ and $(5, 1)$.

Now begin to simplify the expression.

$$1 - (-3) = 4$$

$$5 - 1 = 4$$

$$\frac{4}{4} = 1$$

Therefore, the slope of the line that passes through the points $(1, -3)$ and $(5, 1)$ is 1.

$$\begin{aligned}m &= \frac{y_2 - y_1}{x_2 - x_1} & (x_1 - y_1) &= (1, -3) \\ &= \frac{1 - (-3)}{5 - 1} & (x_2 - y_2) &= (5, 1) \\ &= \frac{4}{4}\end{aligned}$$

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

= 1

Example Two

EXAMPLE 2

What is the slope of the line that passes through the points (4,10) and (12, -2) ?

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

$(x_1 - y_1) = ($ $,$ $)$

$(x_2 - y_2) = ($ $,$ $)$

Enter the correct values above and click submit.

Submit

What is the slope of the line that passes through the points (4, 10) and (12, -2) ?

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

Recall that the slope formula can be used to find the slope of a line that passes through two given points.

$$(x_1 - y_1) = (?, ?)$$

$$(x_2 - y_2) = (?, ?)$$

Enter the correct values above and click submit.

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Example Two (continued)

EXAMPLE 2

What is the slope of the line that passes through the points (4,10) and (12,-2) ?

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

The following answers are both acceptable.

Option 1: $(x_1 - y_1) = (4, 10)$ and $(x_2 - y_2) = (12, -2)$

or

Option 2: $(x_1 - y_1) = (12, -2)$ and $(x_2 - y_2) = (4, 10)$

What is the slope of the line that passes through the points (4, 10) and (12, -2) ?

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

The following answers are both acceptable.

Option 1: $(x_1 - y_1) = (4, 10)$ and $(x_2 - y_2) = (12, -2)$

or

Option 2: $(x_1 - y_1) = (12, -2)$ and $(x_2 - y_2) = (4, 10)$

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Example Two (continued)

EXAMPLE 2

What is the slope of the line that passes through the points (4,10) and (12,-2) ?

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

Let $(x_1 - y_1) = (4, 10)$ and $(x_2 - y_2) = (12, -2)$.

Substitute the appropriate values into the slope formula and click submit.

$$m = \frac{\square - \square}{\square - \square}$$

What is the slope of the line that passes through the points (4, 10) and (12, -2) ?

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

Let $(x_1 - y_1) = (4, 10)$ and $(x_2 - y_2) = (12, -2)$.

Substitute the appropriate values in the slope formula and click submit.

$$m = \frac{? - ?}{? - ?}$$

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Example Two (continued)

EXAMPLE 2

What is the slope of the line that passes through the points (4,10) and (12,-2) ?

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

If $(x_1 - y_1) = (4, 10)$ and $(x_2 - y_2) = (12, -2)$,
then the following substitutions are correct:

$$m = \frac{-2 - 10}{12 - 4}$$

Next

What is the slope of the line that passes through the points (4, 10) and (12, -2) ?

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

If $(x_1 - y_1) = (4, 10)$ and $(x_2 - y_2) = (12, -2)$, then the following substitutions are correct:

$$m = \frac{-2 - 10}{12 - 4}$$

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Example Two (continued)

EXAMPLE 2

What is the slope of the line that passes through the points (4,10) and (12,-2) ?

$$m = \frac{-2 - 10}{12 - 4}$$

After substituting the expression, you find that the slope of the line is...

-1 $-\frac{3}{2}$ $\frac{3}{4}$ 1

What is the slope of the line that passes through the points (4, 10) and (12, -2) ?

$$m = \frac{-2 - 10}{12 - 4}$$

After substituting the expression, you find that the slope of the line is...

- A) -1
- B) $-\frac{3}{2}$
- C) $\frac{3}{4}$
- D) 1

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Example Two (continued)

EXAMPLE 2

What is the slope of the line that passes through the points (4,10) and (12, -2) ?

$$\begin{aligned} m &= \frac{-2 - 10}{12 - 4} \\ &= \frac{-12}{8} \\ &= -\frac{3}{2} \end{aligned}$$

The slope of the line that passes through the points (4,10) and (12, -2) is $-\frac{3}{2}$.

$-\frac{3}{2}$ Menu

What is the slope of the line that passes through the points (4, 10) and (12, -2) ?

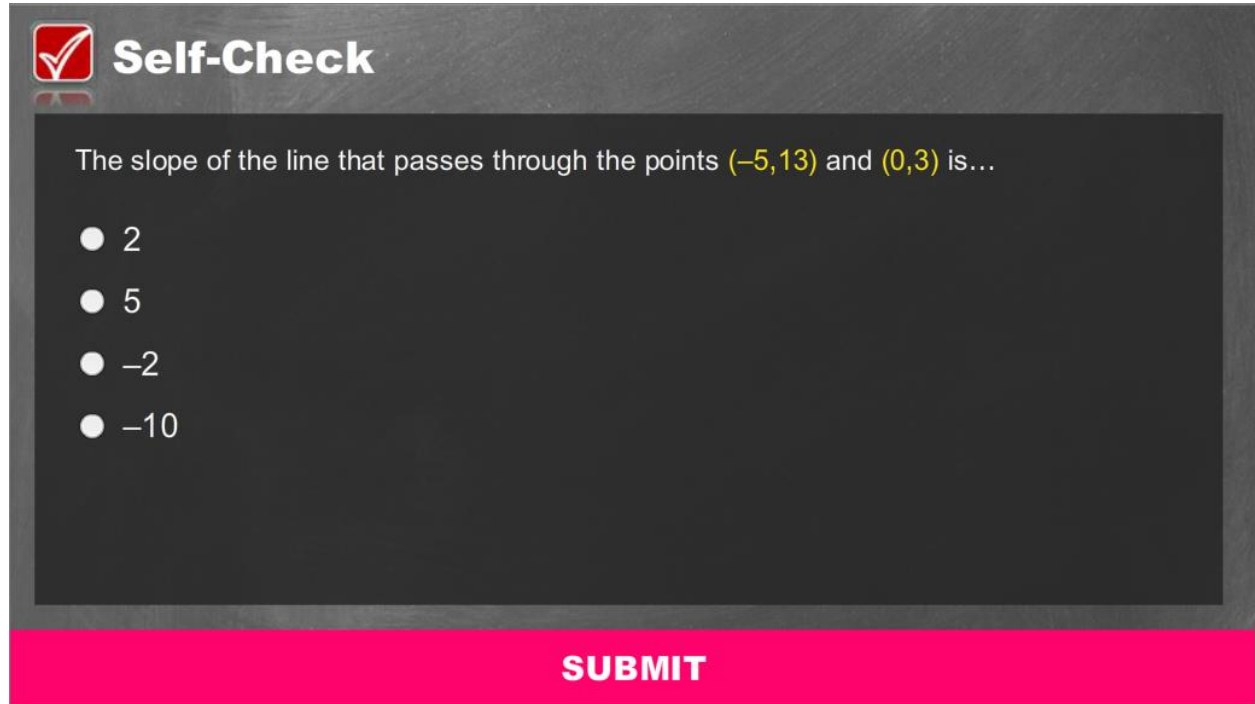
$$\begin{aligned} m &= \frac{-2 - 10}{12 - 4} \\ &= \frac{-12}{8} \\ &= -\frac{3}{2} \end{aligned}$$


The slope of the line that passes through the points (4, 10) and (12, -2) is $-\frac{3}{2}$.

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Self-Check



 **Self-Check**

The slope of the line that passes through the points $(-5,13)$ and $(0,3)$ is...

- 2
- 5
- 2
- 10

SUBMIT

Solve the problem in the image above to check your understanding of the content.

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Self-Check: Answer

Correct

That's correct! Let $(x_1 - y_1) = (-5, 13)$ and $(x_2 - y_2) = (0, 3)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Substitute the appropriate values.

$$= \frac{3 - 13}{0 - (-5)}$$

Simplify the expression.

$$= \frac{-10}{5}$$

The slope of the line is -2 .

Continue

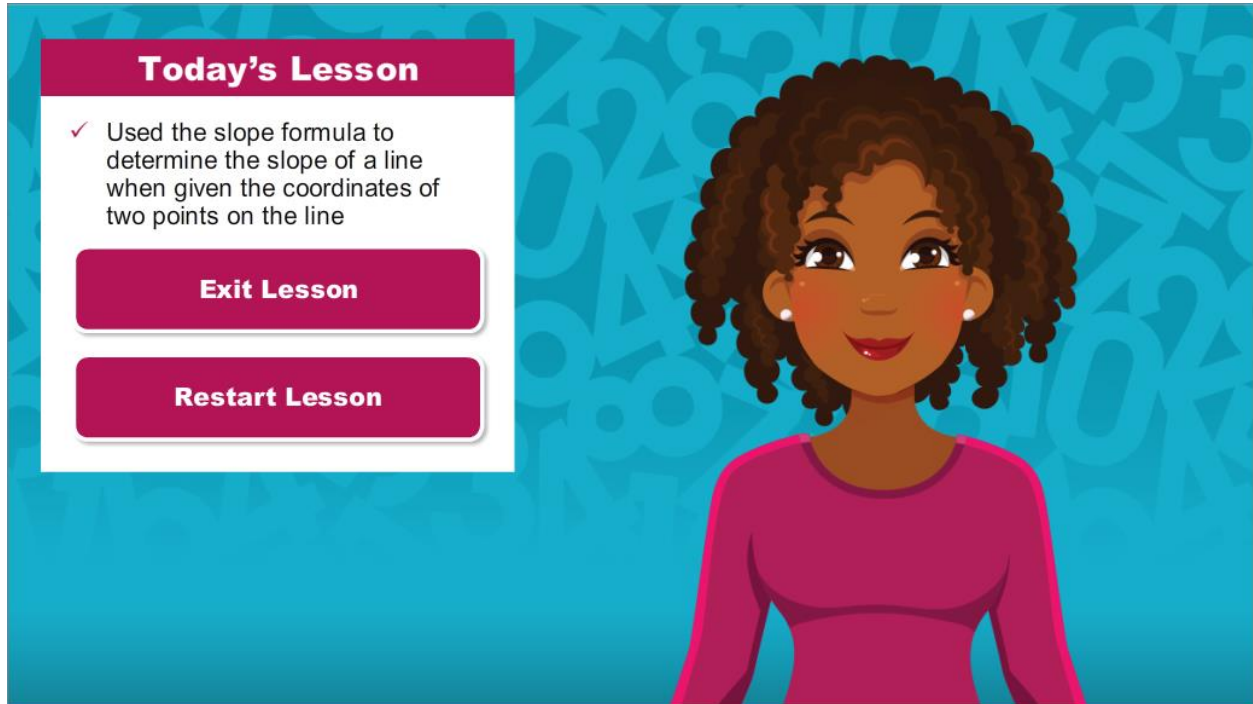
SUBMIT

For your reference, the image above shows the correct solution to the self-check problem.

Module 9: Writing Linear Equations

Topic 1 Content: Determining the Slope of a Line When Given Two Points on the Line

Conclusion



The image shows a digital lesson conclusion screen. On the left, a white box with a pink header titled "Today's Lesson" contains a checkmark and the text: "Used the slope formula to determine the slope of a line when given the coordinates of two points on the line". Below this text are two pink buttons: "Exit Lesson" and "Restart Lesson". On the right side of the screen is a cartoon illustration of a young woman with dark curly hair, wearing a pink long-sleeved shirt, set against a blue background with faint mathematical symbols.

You have reached the conclusion of this lesson where you learned how to use the slope formula to determine the slope of a line when given the coordinates of two points on the line.