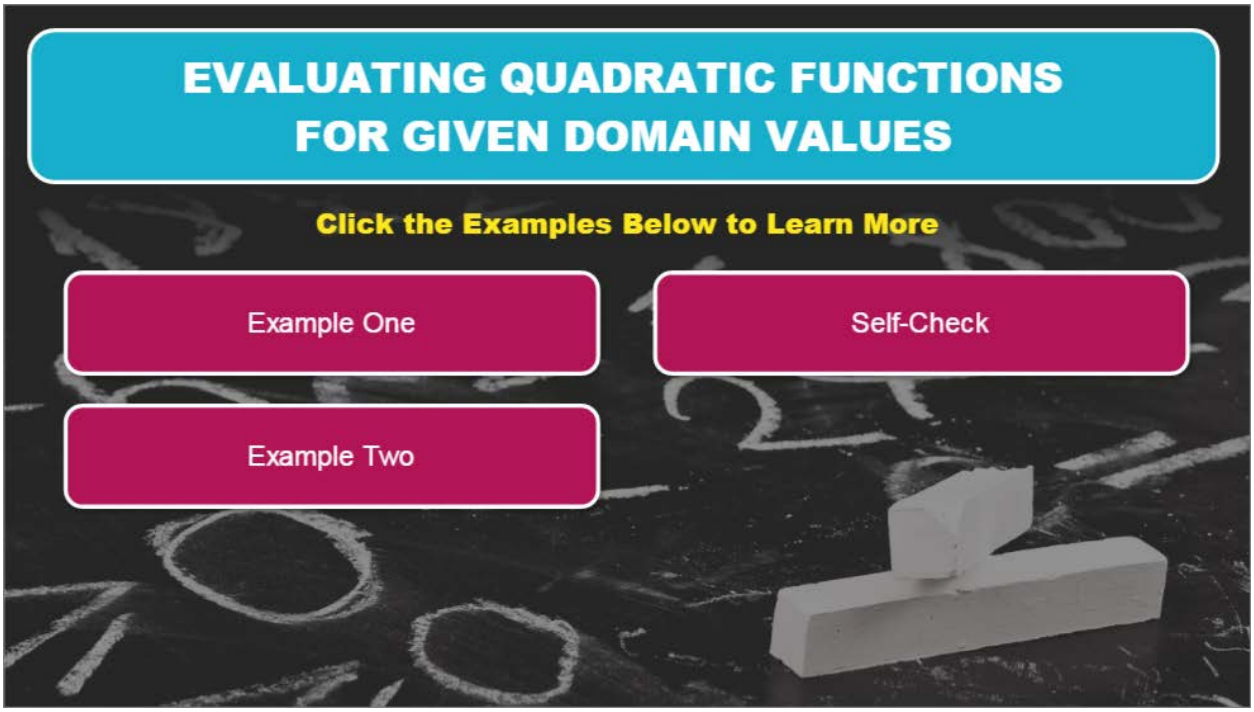
Module 10: Linear and Quadratic Function Families

Topic 3 Content: Evaluating Quadratic Functions For Given Domain Values Notes

Introduction

Hello and welcome! I'm so glad you could join me for this lesson in Algebra I, where you will learn how to evaluate quadratic functions for given values of the domain.

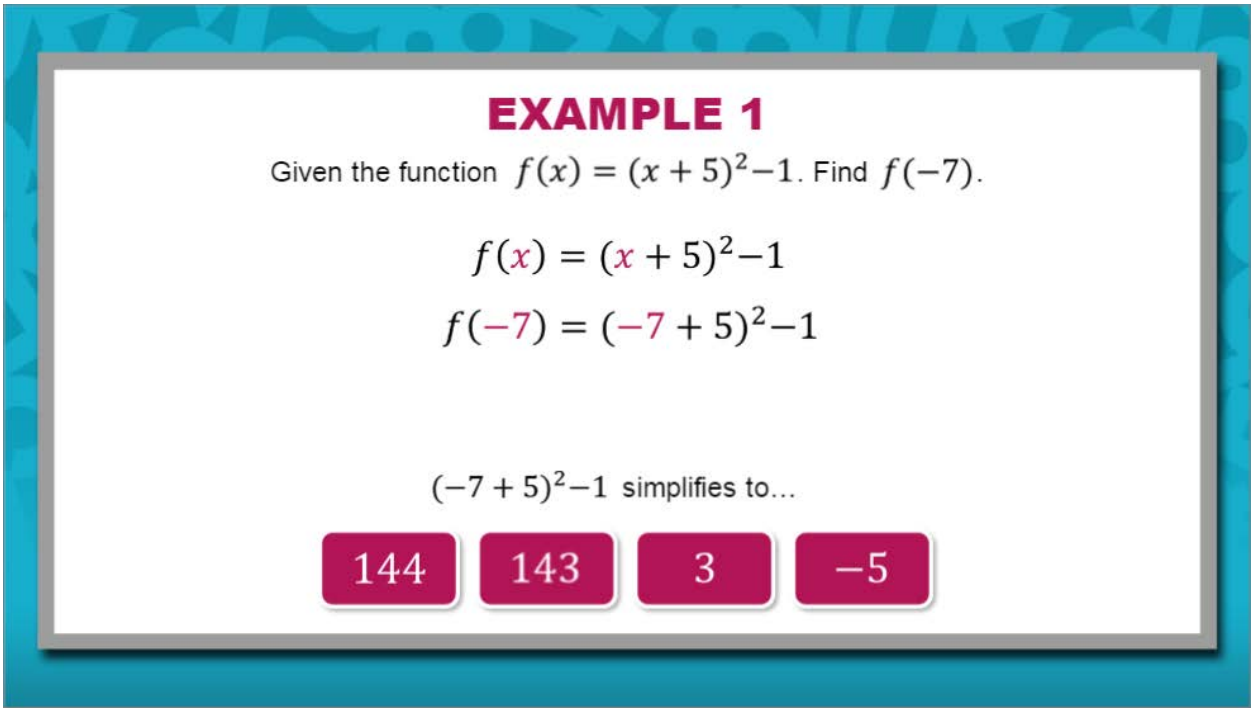
Evaluating Quadratic Functions For Given Domain Values



Click the examples below to learn more.

- Example One
- Example Two
- Self-Check

Example One



Given the function $f(x) = (x + 5)^2 - 1$. Find $f(-7)$.

$$f(x) = (x + 5)^2 - 1$$

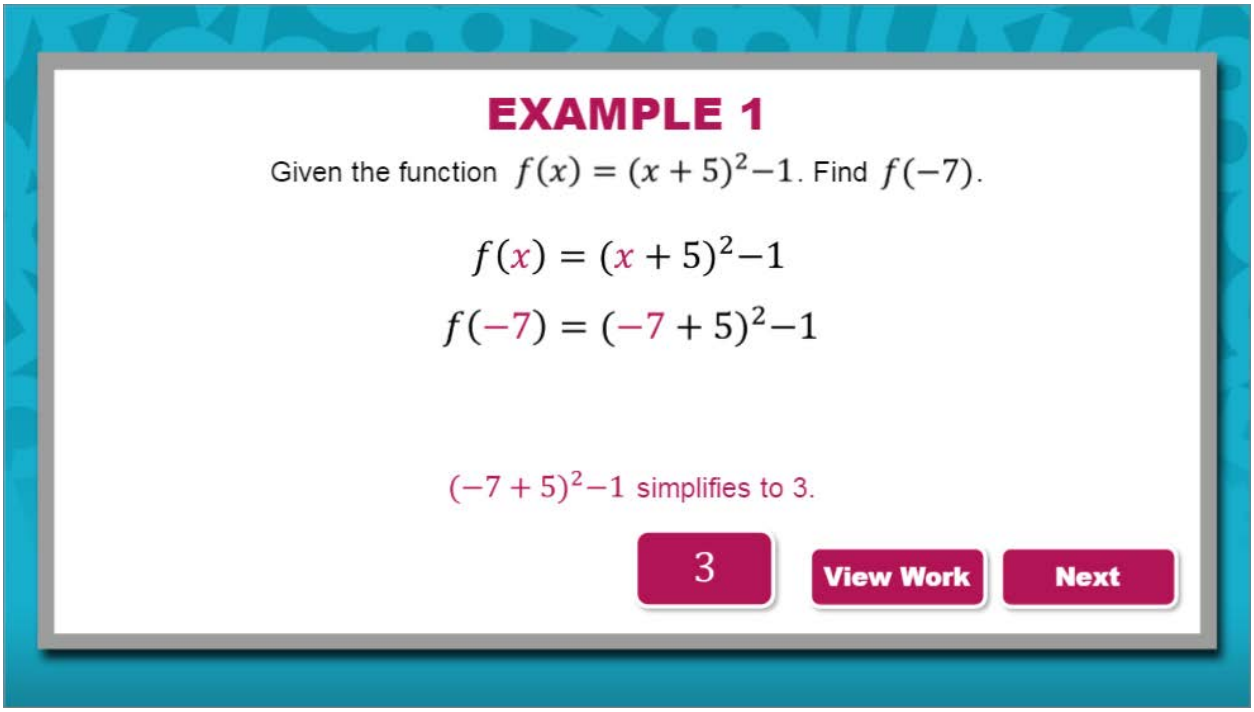
$$f(-7) = (-7 + 5)^2 - 1$$

To find $f(-7)$, substitute -7 for x. Then, use the order of operations to simplify the expression on the right side of the equation

$(-7 + 5)^2 - 1$ simplifies to...

A) 144
B) 143
C) 3
D) -5

Example One (continued)



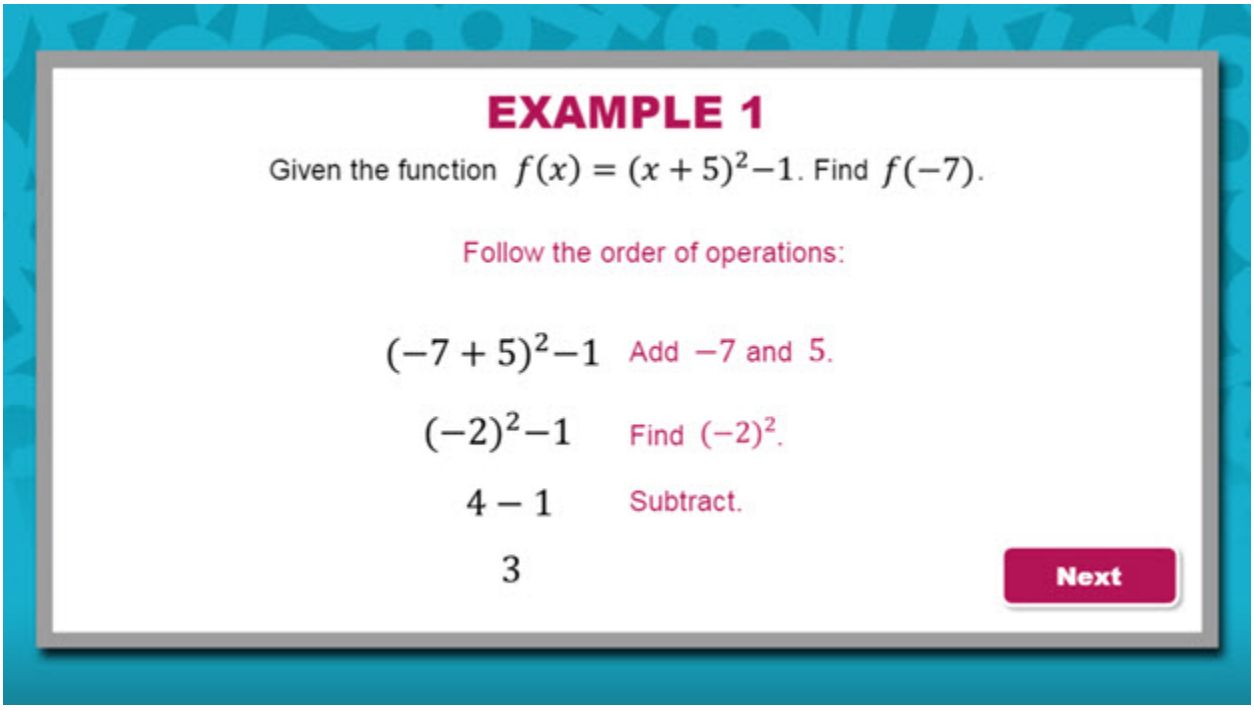
Given the function $f(x) = (x + 5)^2 - 1$. Find $f(-7)$.

$$f(x) = (x + 5)^2 - 1$$

$$f(-7) = (-7 + 5)^2 - 1$$

$(-7 + 5)^2 - 1$ simplifies to 3.

Example One (continued)



Given the function $f(x) = (x+5)^2 - 1$. Find $f(-7)$.

Follow the order of operations:

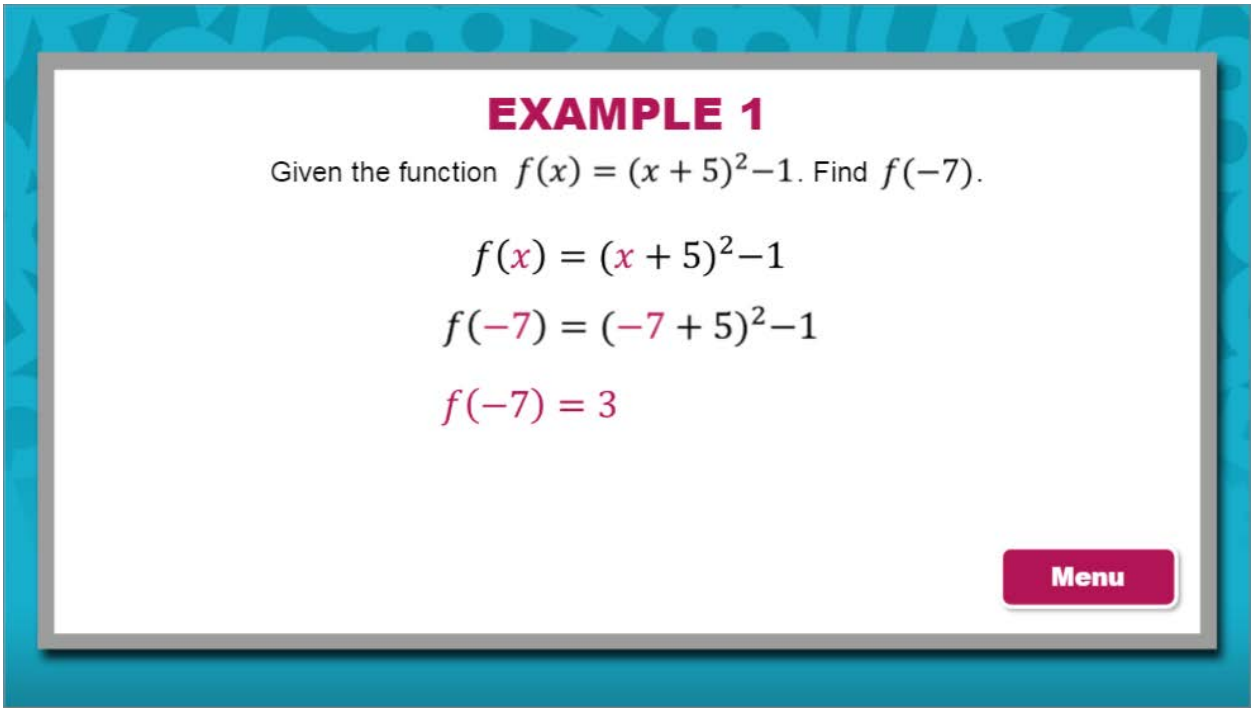
$(-7+5)^2 - 1$ Add -7 and 5.

$(-2)^2 - 1$ Find $(-2)^2$.

$4 - 1$ Subtract.

3

Example One (continued)



Given the function $f(x) = (x + 5)^2 - 1$. Find $f(-7)$.

$$f(x) = (x + 5)^2 - 1$$

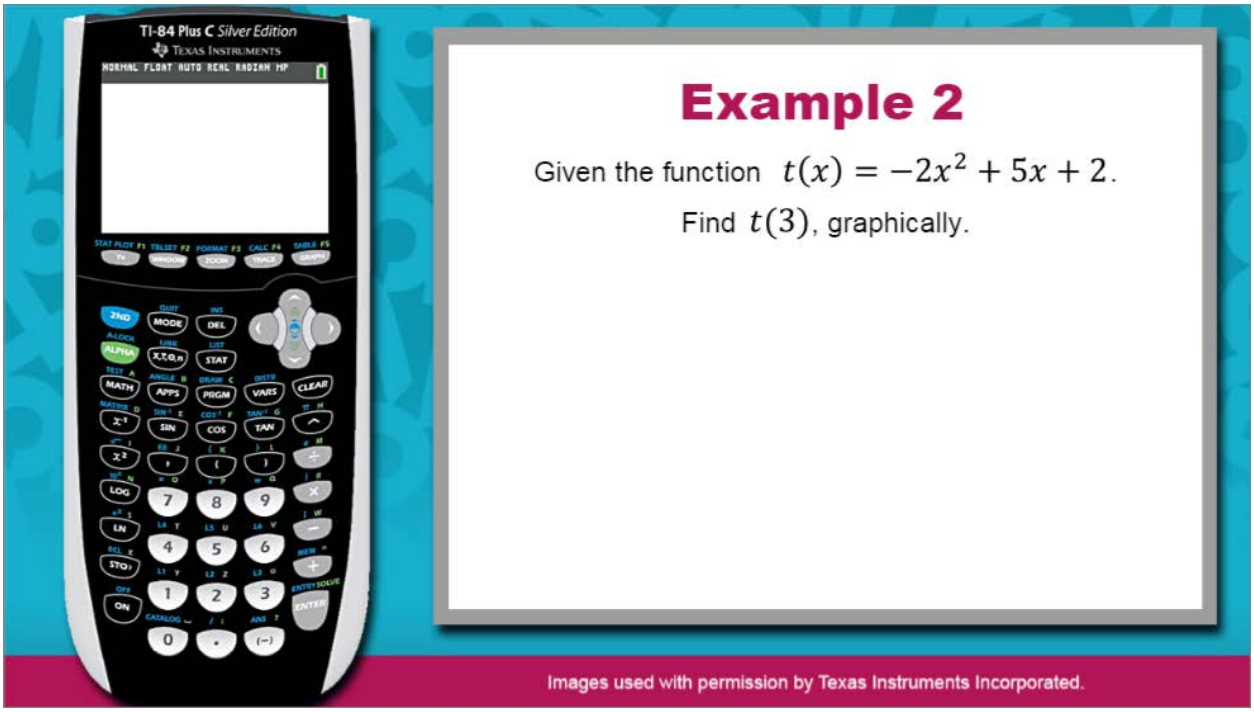
$$f(-7) = (-7 + 5)^2 - 1$$

$$f(-7) = 3$$

Your work is complete.

After simplifying the expression you find that $f(-7) = 3$.

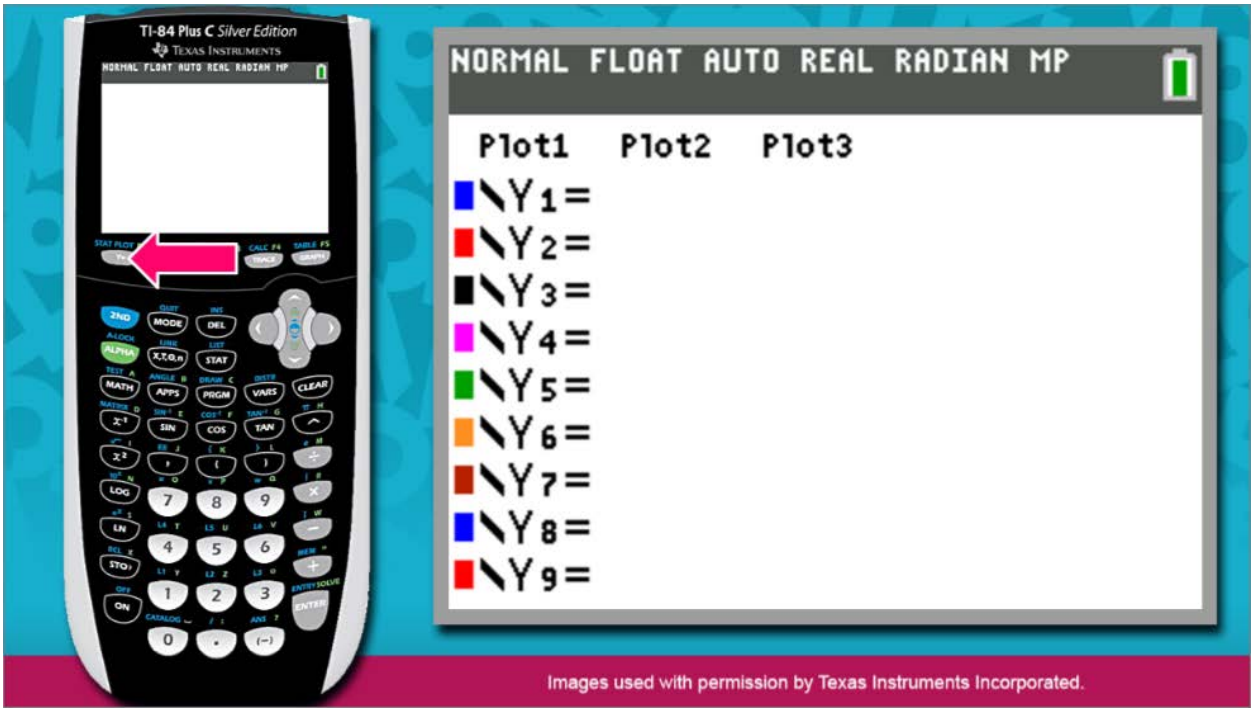
Example Two



Given the function $t(x) = -2x^2 + 5x + 2$. Find $t(3)$, graphically.

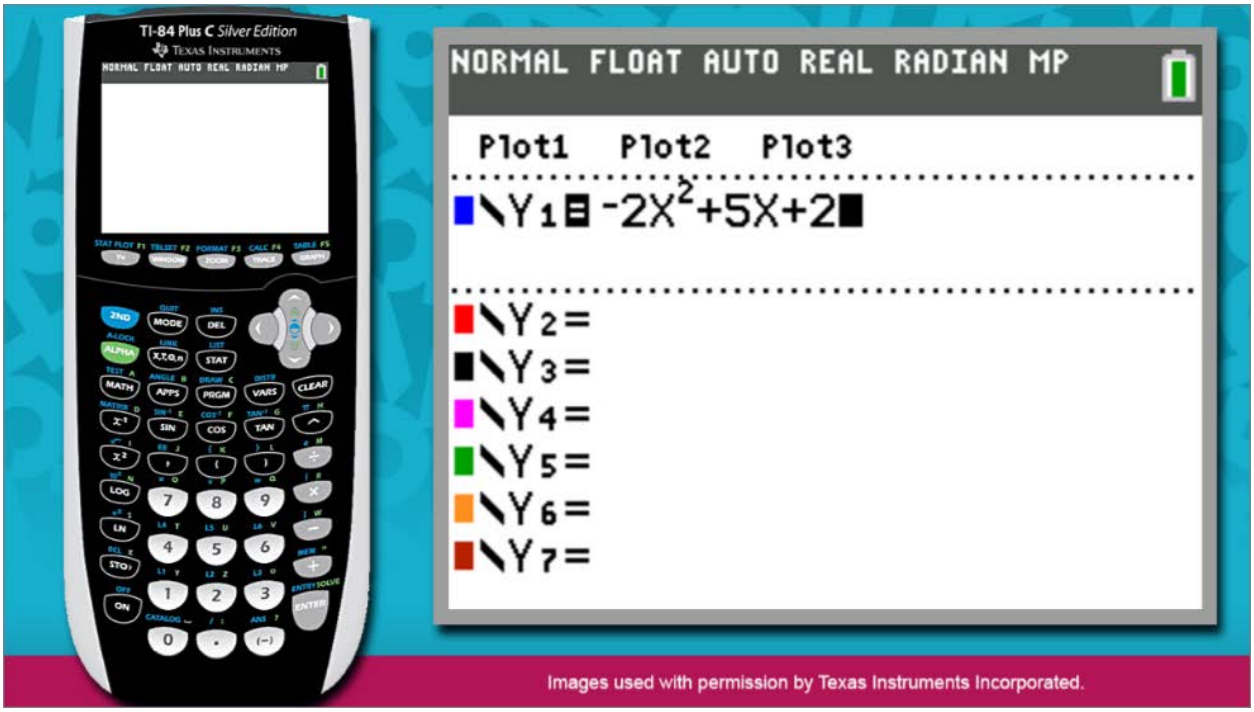
You can use the graphing calculator to find the value of the function when $x = 3$.

Example Two (continued)



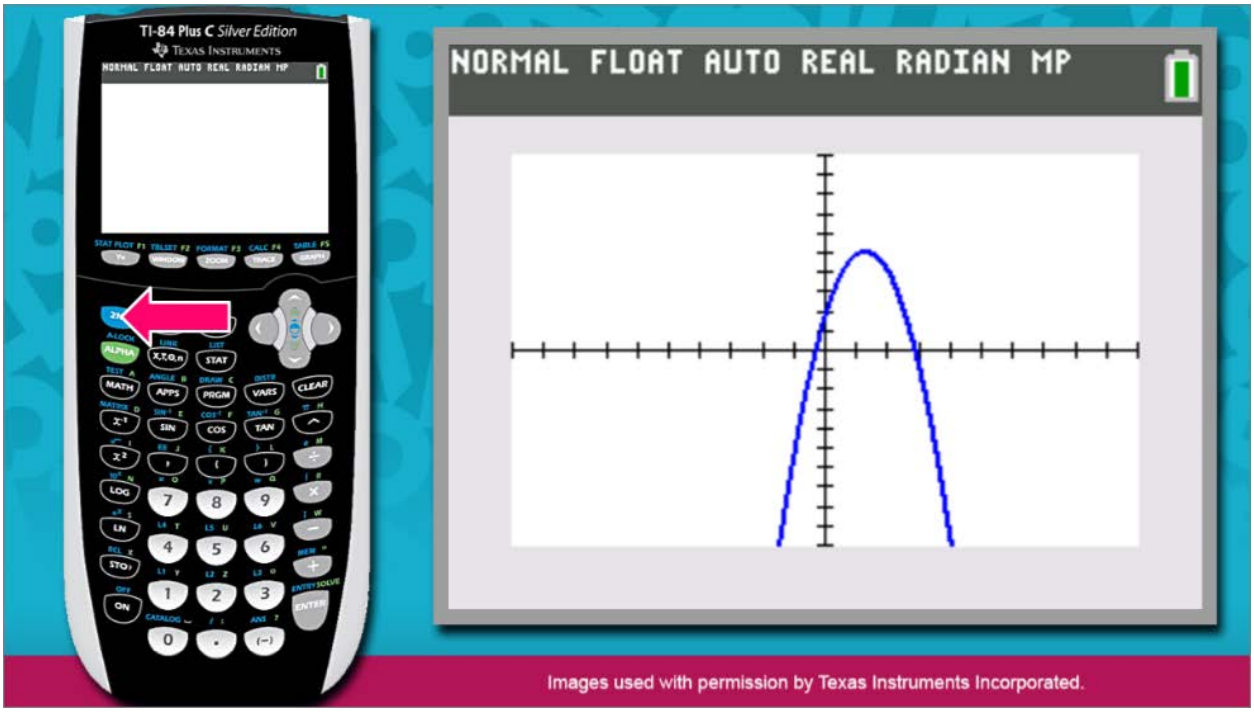
Press the Y= key.

Example Two (continued)



Now, enter the polynomial expression $-2x^2 + 5x + 2$ to the right of Y1.

Example Two (continued)

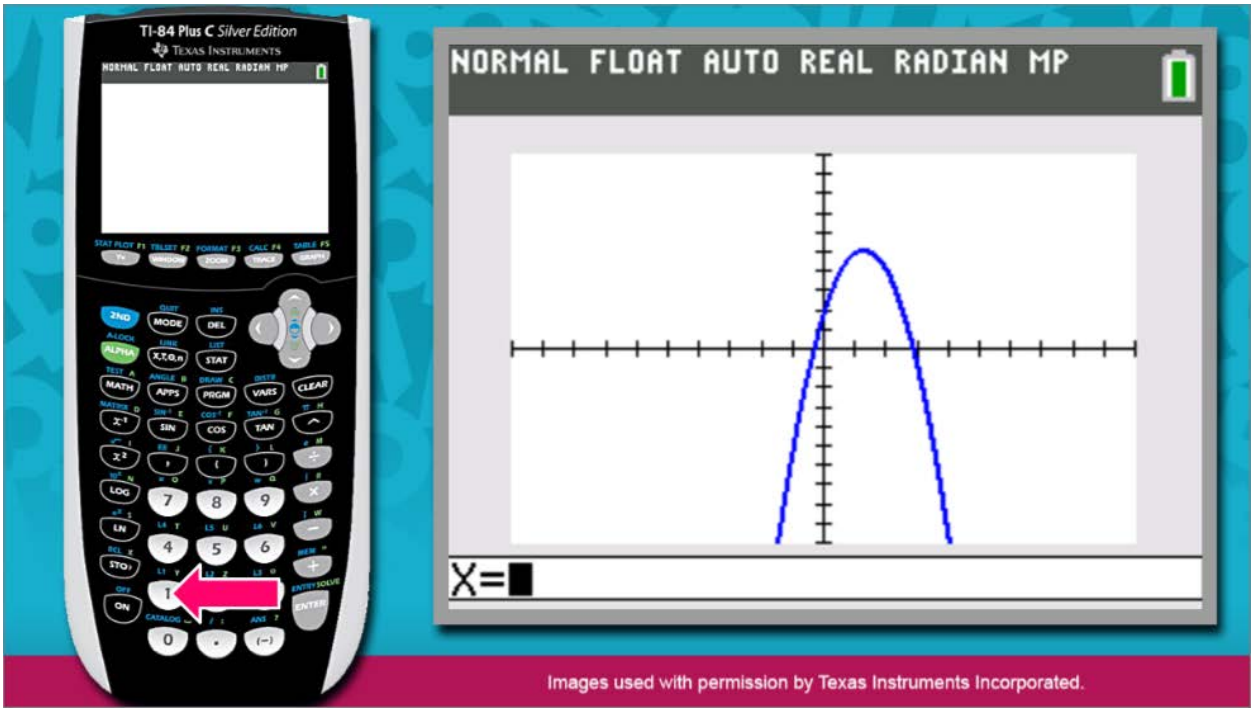


Next, press GRAPH.

Now that you have graphed the function, you can find $t(3)$.

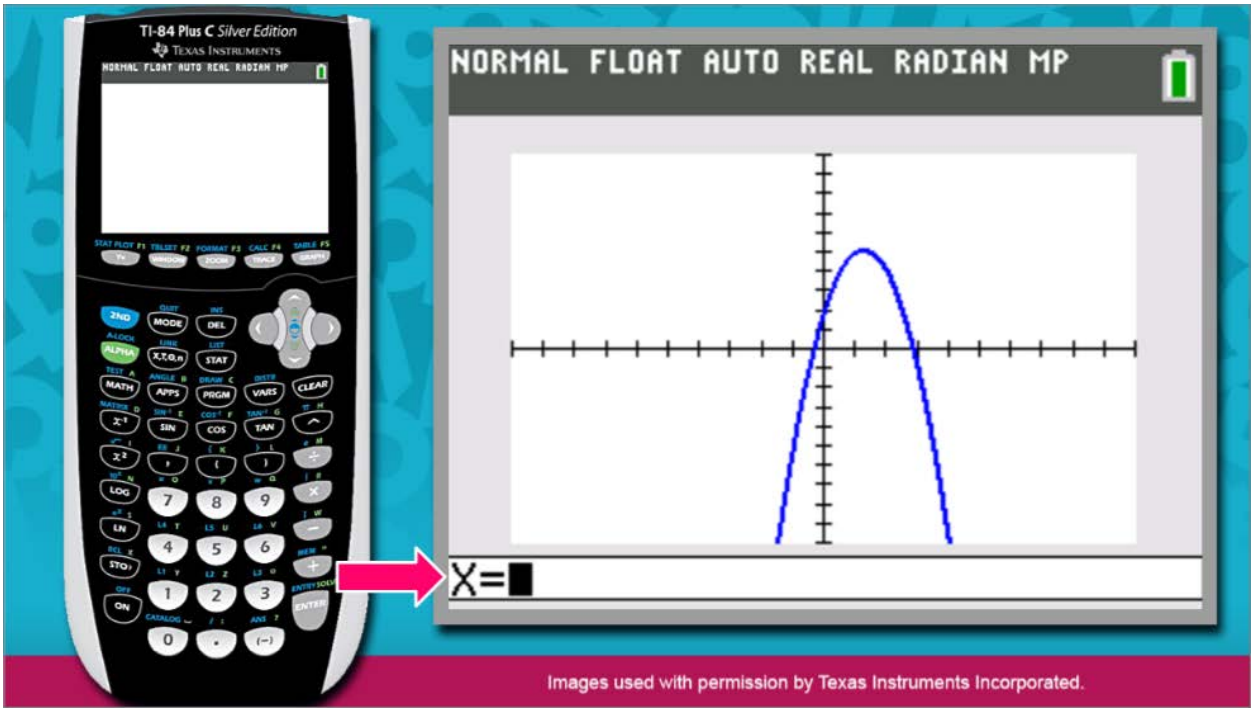
Press 2nd. This allows you to access a function stamped above a calculator key.

Example Two (continued)



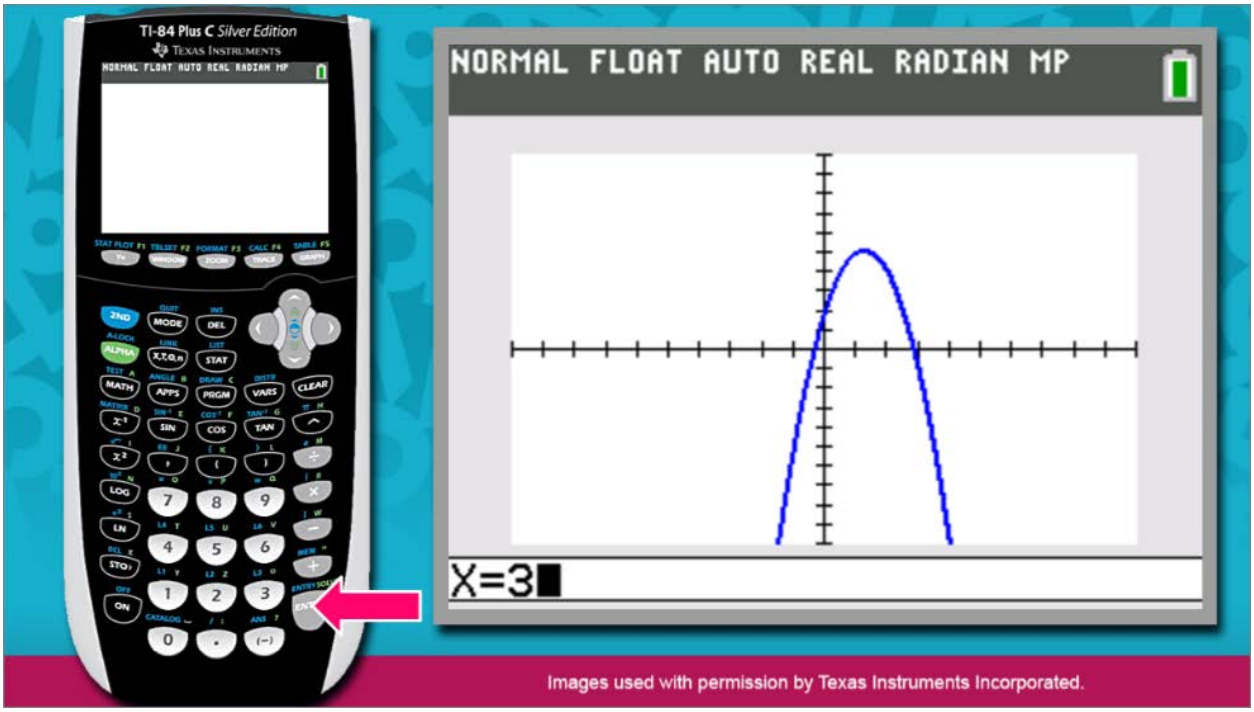
Press the TRACE key to access the CALCULATE menu. Press 1 to access the value option. This option allows you to enter an input value.

Example Two (continued)



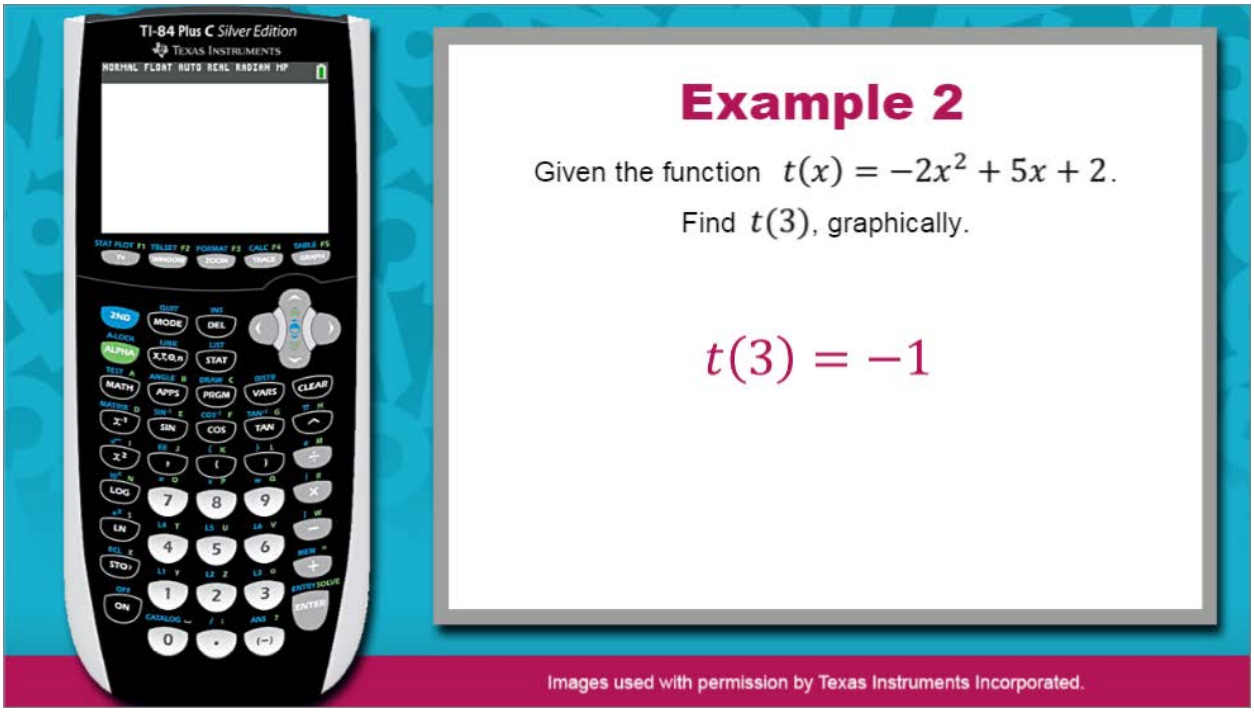
Notice that in the bottom left corner of the window the calculator is prompting you to enter a value for x.

Example Two (continued)



Press 3. Then, press ENTER.

Example Two (continued)

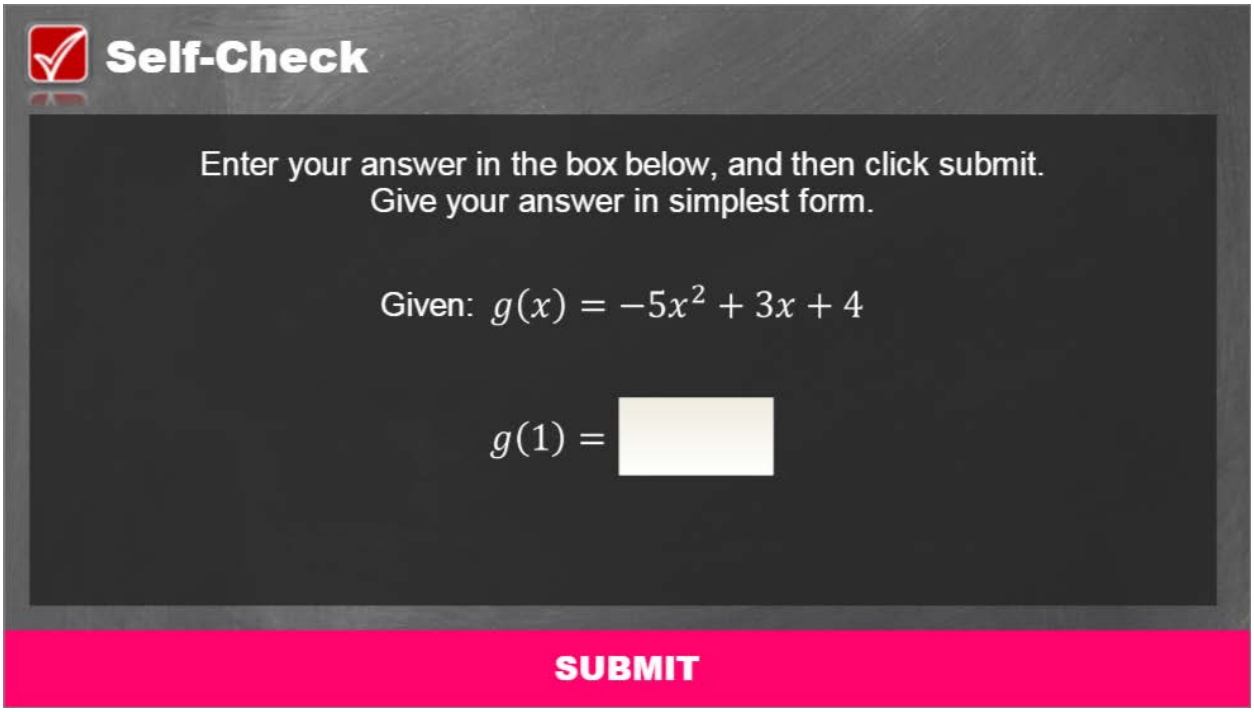


The cursor is blinking at the point on the graph located at $(3, -1)$.

At the bottom of the window, the calculator also informs you that an input value of 3 results in an output value of -1.

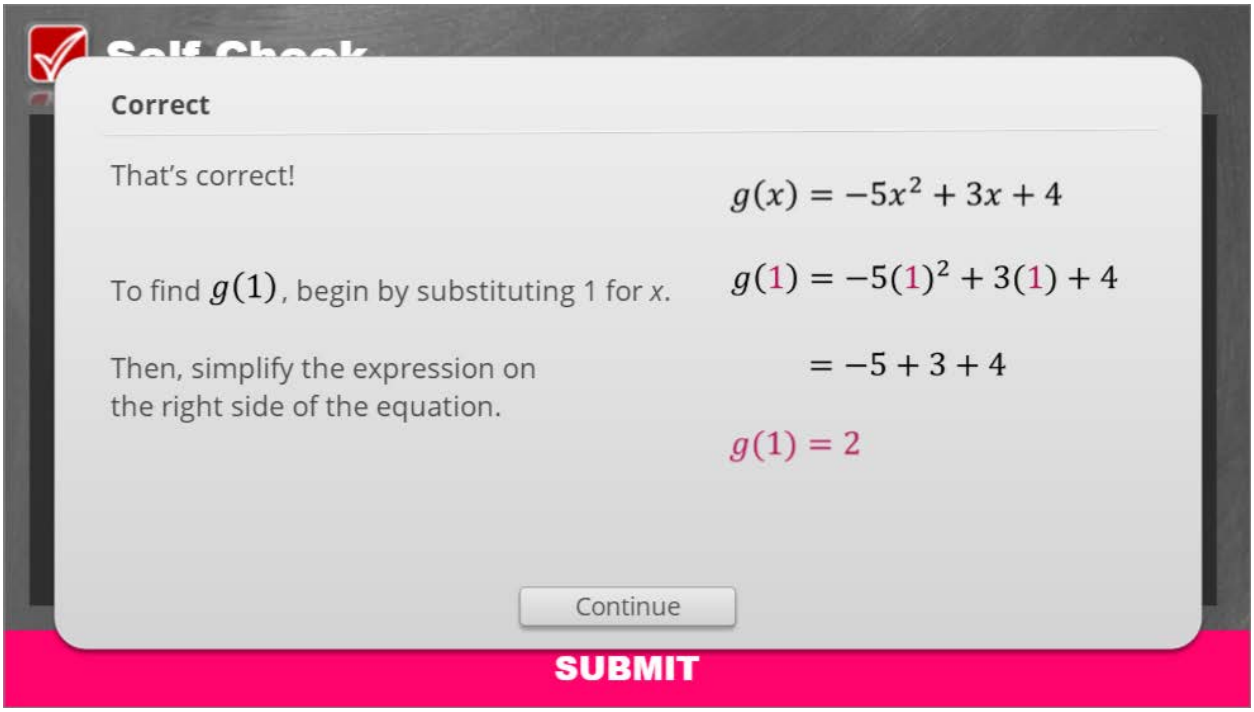
Therefore, $t(3) = -1$.

Self-Check 1



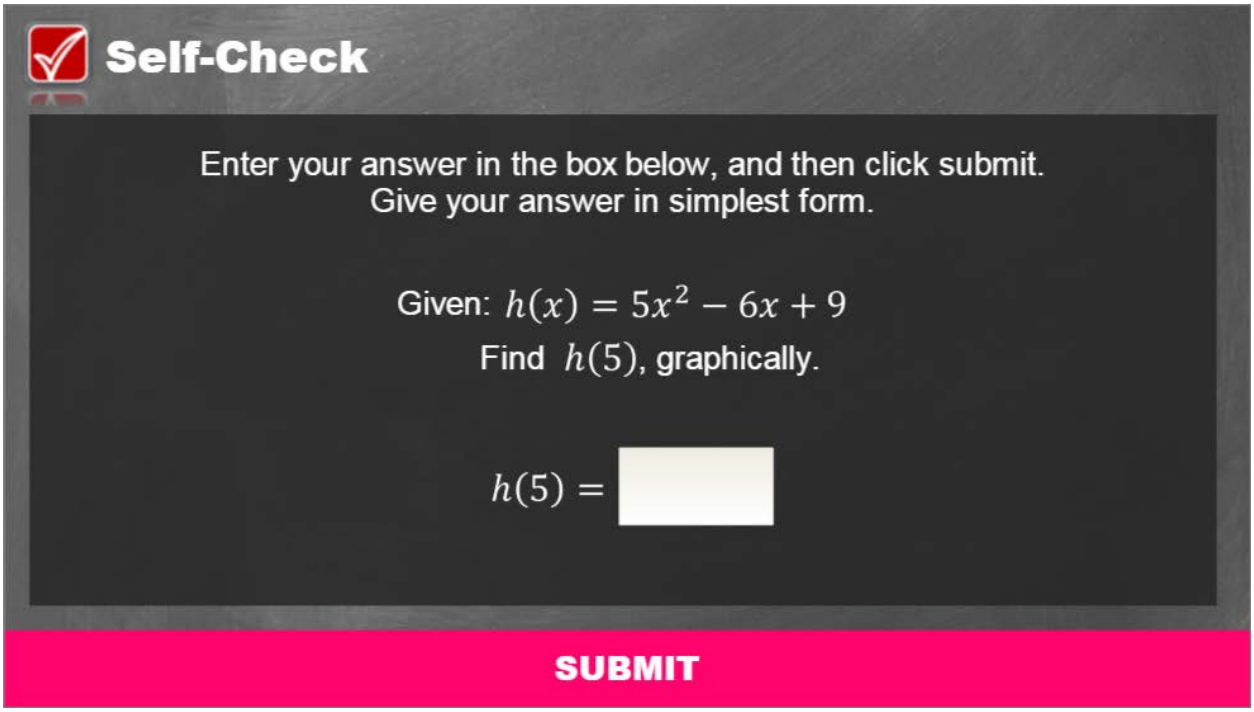
Solve the problem in the image above to check your understanding of the content.

Self-Check 1: Answer



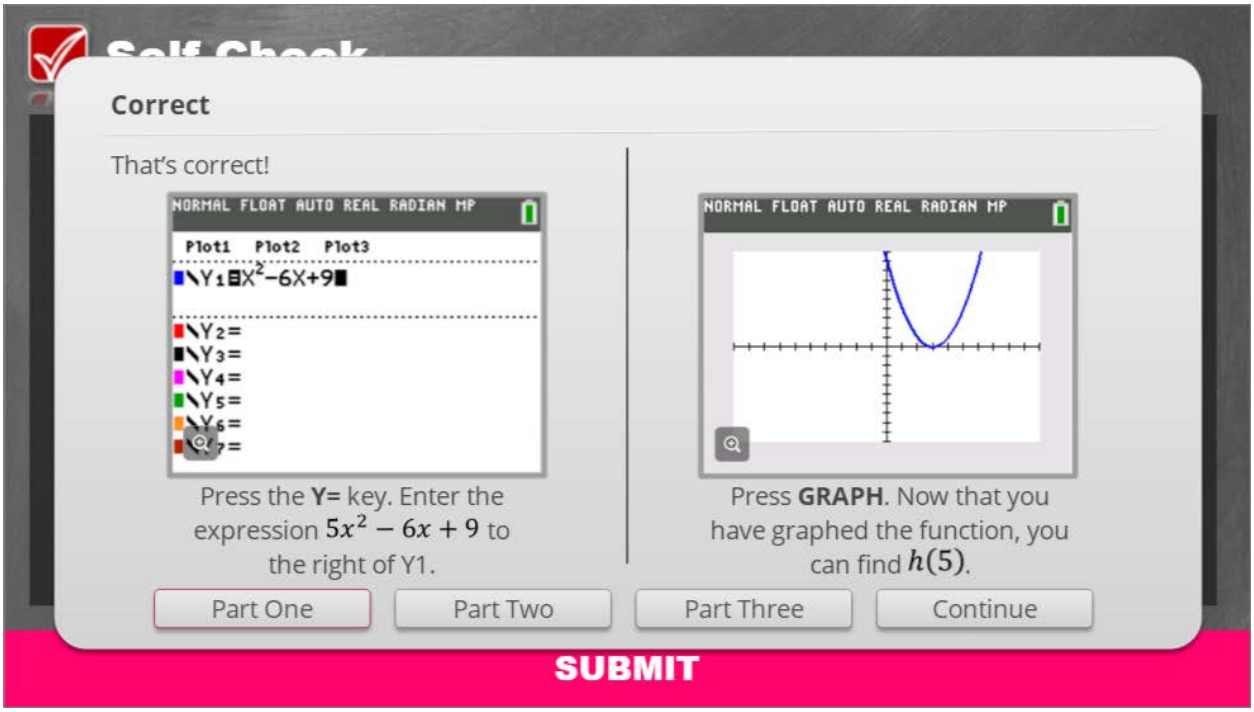
For your reference, the image above shows the correct solution to the self-check problem.

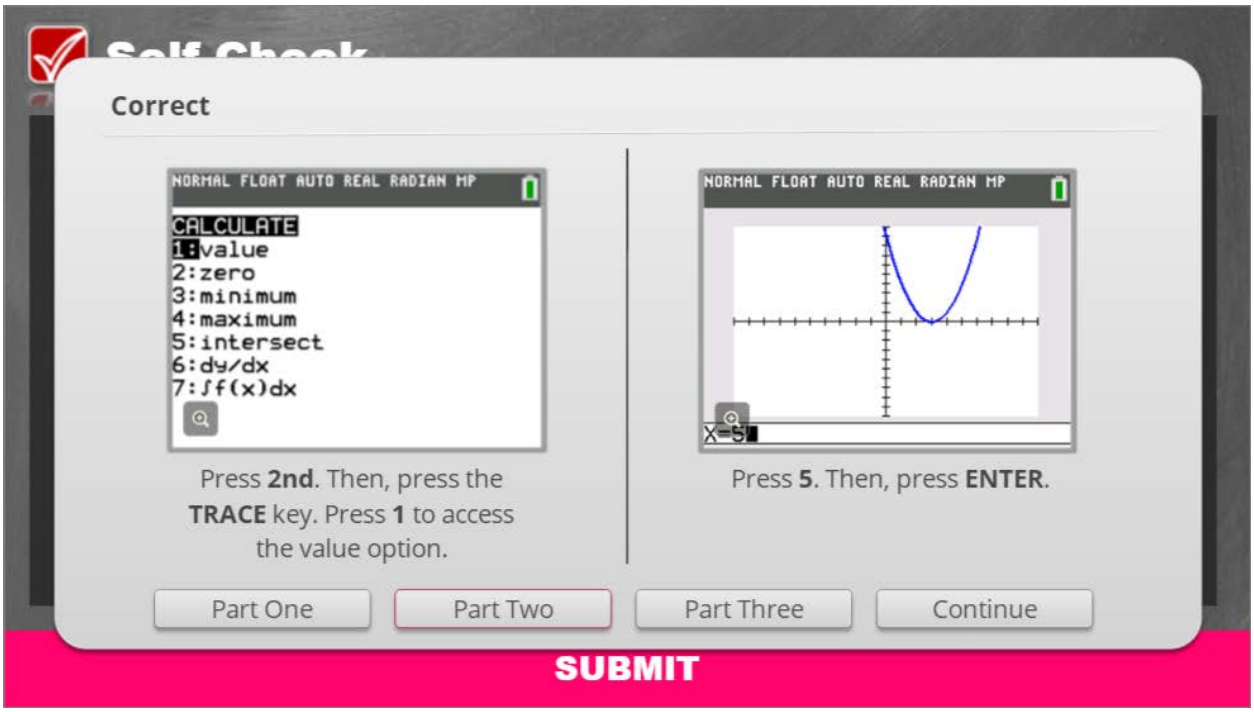
Self-Check 2



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

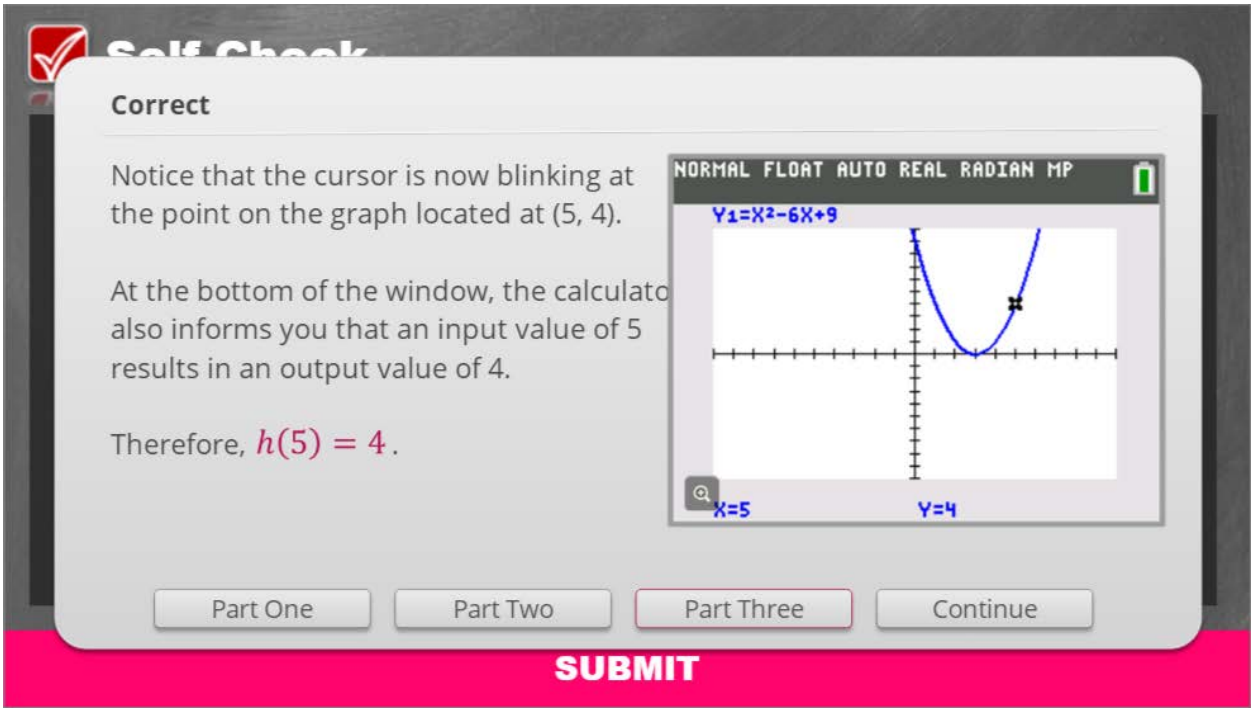
Self-Check 2: Answer





For your reference, the images above show the correct solution to the self-check problem.

Self-Check 2: Answer (continued)



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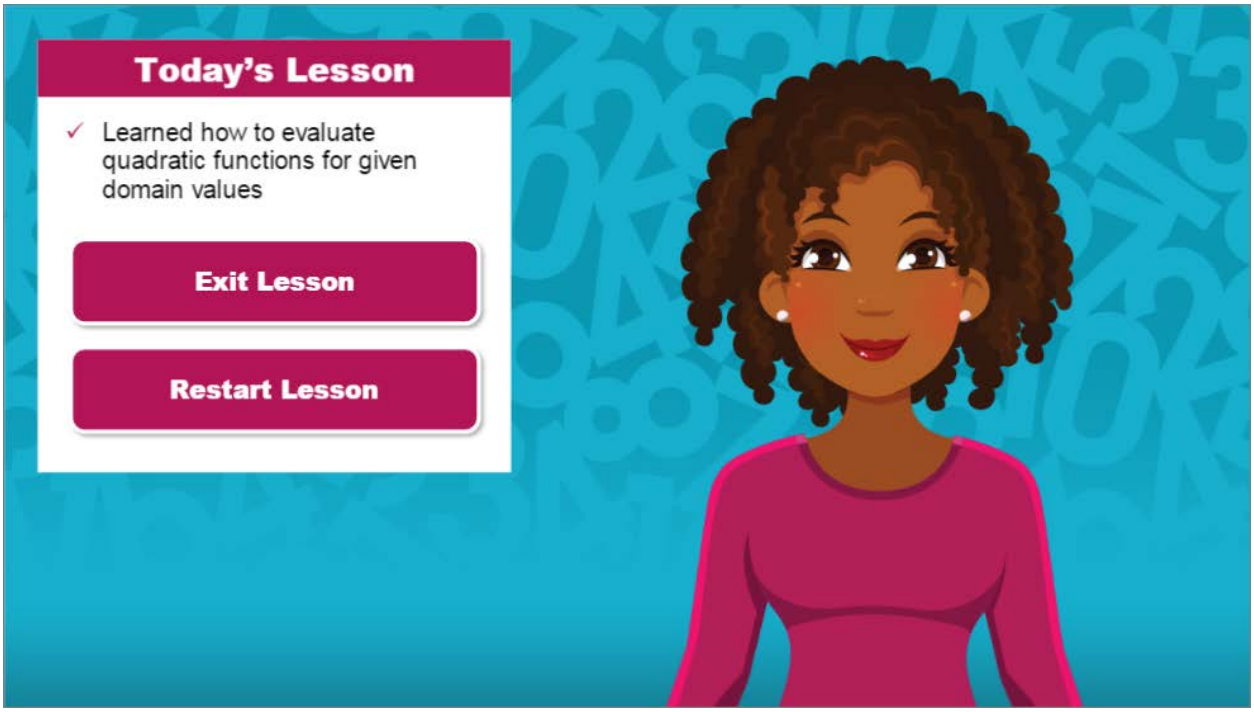
Conclusion



You have reached the conclusion of this lesson, where you learned how to evaluate quadratic functions for given domain values.