

Module 10: Linear and Quadratic Function Families

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

Introduction

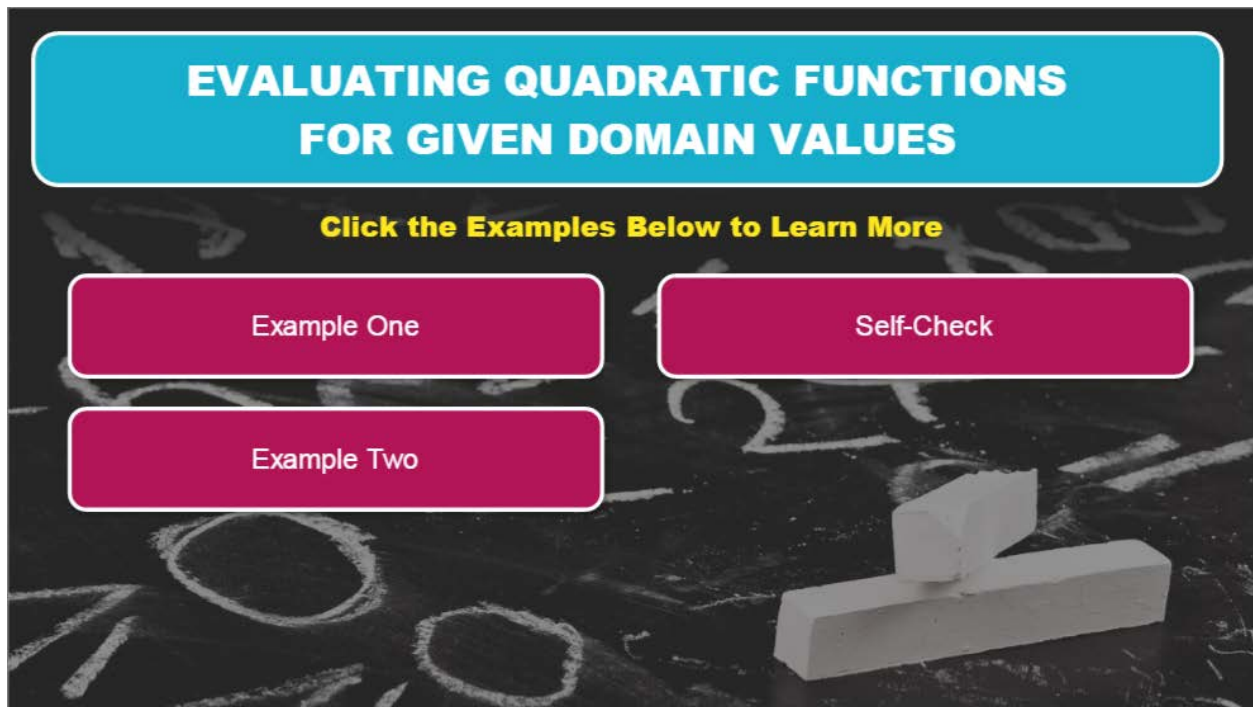


Today's Lesson

- You will learn how to evaluate quadratic functions for given values of the domain.

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.

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Evaluating Quadratic Functions For Given Domain Values



The graphic features a dark background with faint chalkboard-style drawings of circles and arrows. At the top, a blue rounded rectangle contains the title "EVALUATING QUADRATIC FUNCTIONS FOR GIVEN DOMAIN VALUES" 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 in a 2x2 grid: "Example One" (top-left), "Self-Check" (top-right), and "Example Two" (bottom-left). In the bottom right corner, there is a 3D rendering of a white rectangular block with a smaller white rectangular block resting on top of it.

Click the examples below to learn more.

- Example One
- Example Two
- Self-Check

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Example One

EXAMPLE 1

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...

144

143

3

-5

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

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Example One (continued)

EXAMPLE 1

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.

3

[View Work](#)

[Next](#)

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.

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Example One (continued)

EXAMPLE 1

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

Follow the order of operations:

$$(-7 + 5)^2 - 1 \quad \text{Add } -7 \text{ and } 5.$$

$$(-2)^2 - 1 \quad \text{Find } (-2)^2.$$

$$4 - 1 \quad \text{Subtract.}$$

$$3$$

Next

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

Follow the order of operations:

$$(-7 + 5)^2 - 1 \quad \text{Add } -7 \text{ and } 5.$$

$$(-2)^2 - 1 \quad \text{Find } (-2)^2.$$

$$4 - 1 \quad \text{Subtract.}$$

$$3$$

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Example One (continued)

EXAMPLE 1

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

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

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

$$f(-7) = 3$$

Menu

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 $f(-7) = 3$.

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Example Two



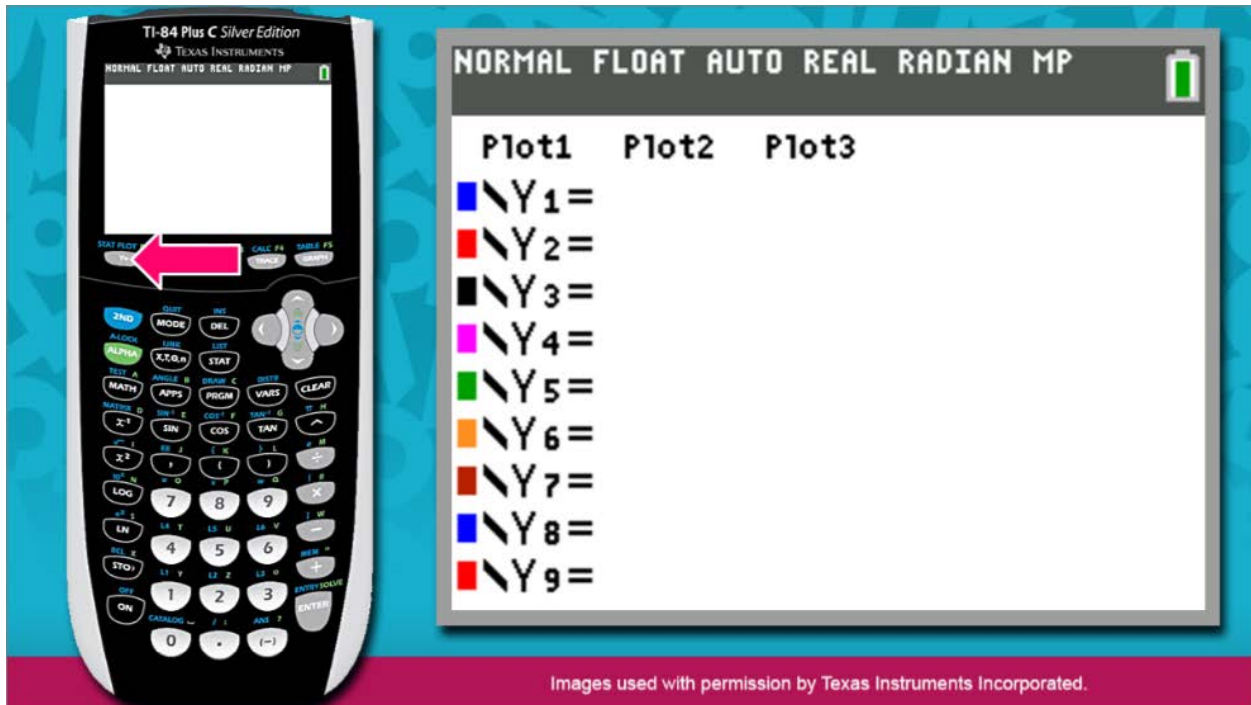
Example 2
Given the function $t(x) = -2x^2 + 5x + 2$.
Find $t(3)$, graphically.

Images used with permission by Texas Instruments Incorporated.

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 $x = 3$.

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Example Two (continued)

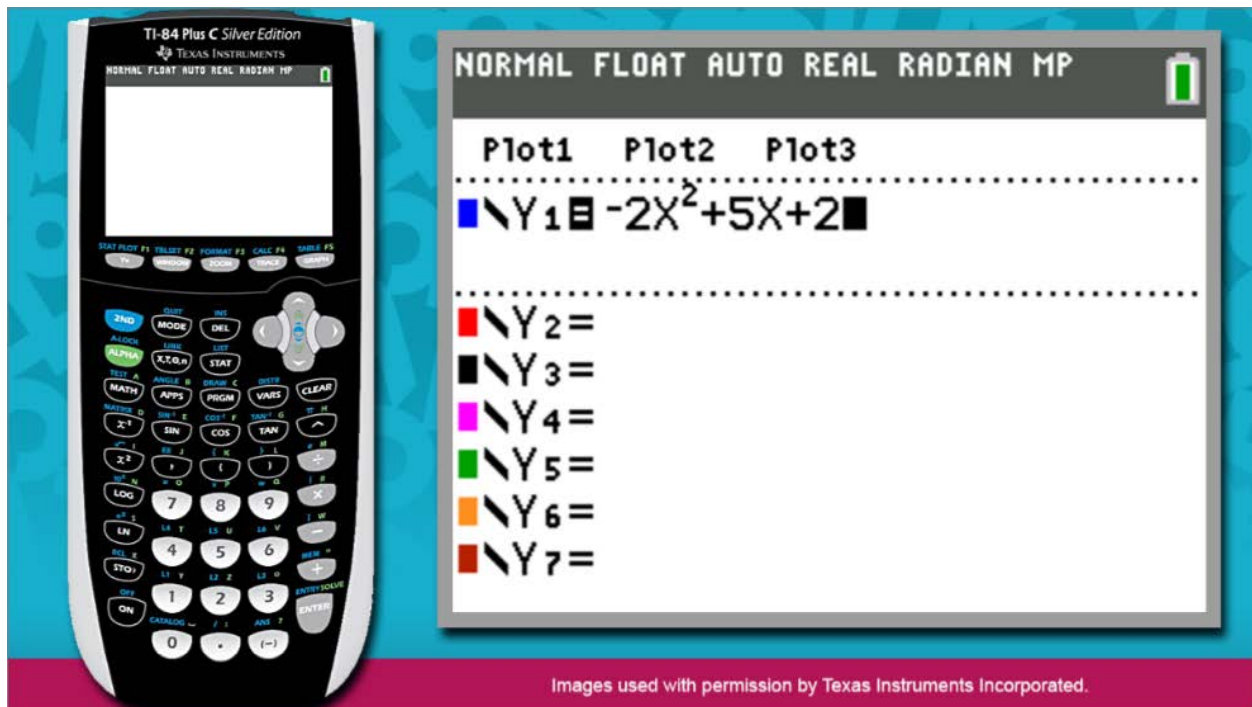


Press the Y= key.

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Example Two (continued)

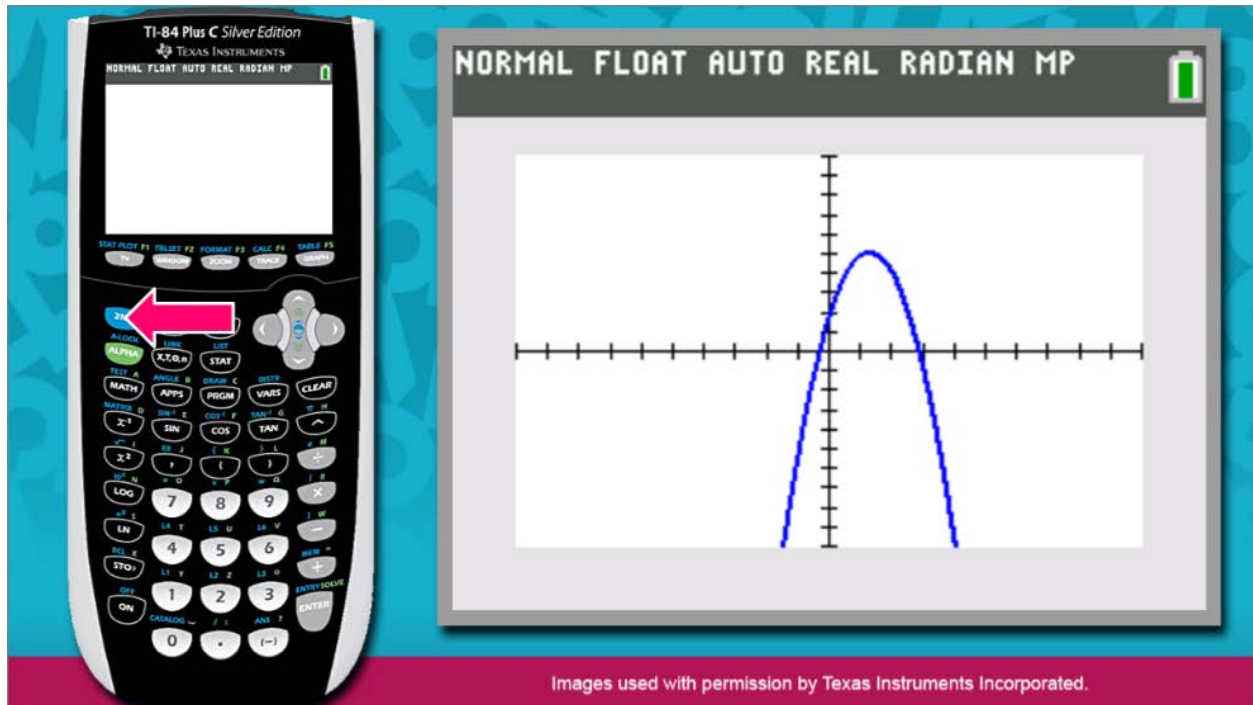


Now, enter the polynomial expression $-2x^2 + 5x + 2$ to the right of Y1.

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Example Two (continued)



Next, press GRAPH.

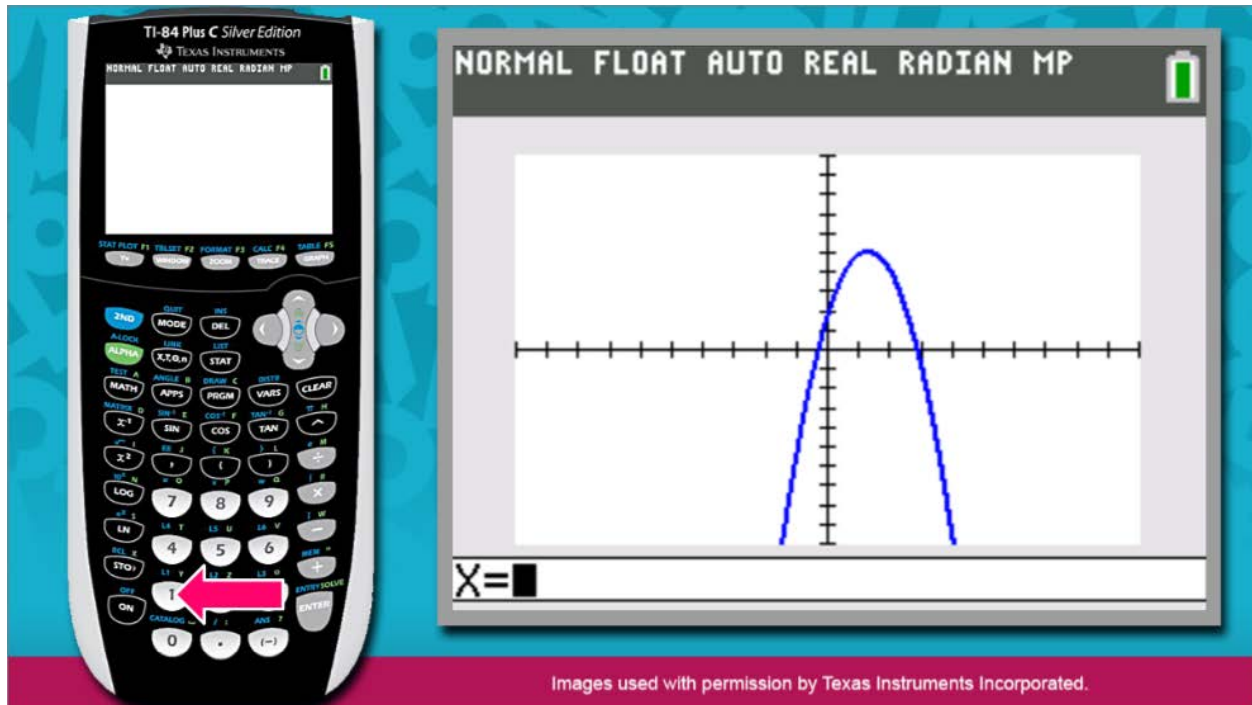
Now that you have graphed the function, you can find $t(3)$.

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

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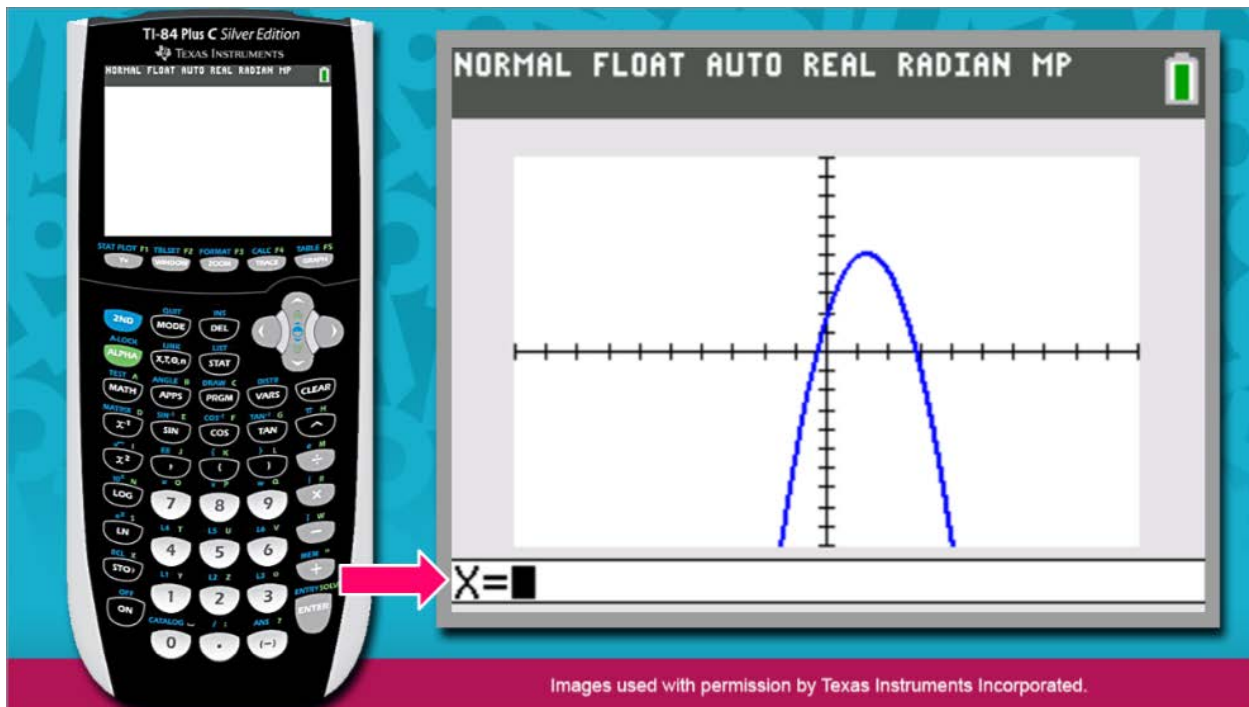
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Example Two (continued)



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.

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Example Two (continued)

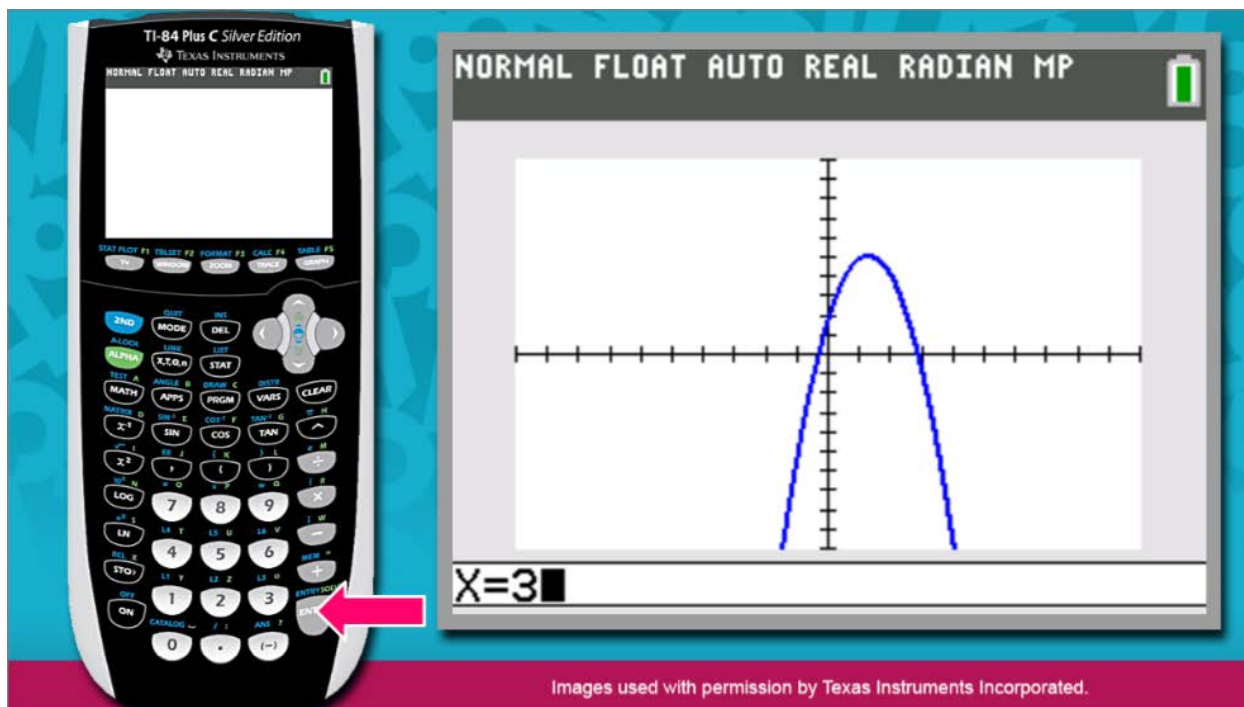


Notice that in the bottom left corner of the window the calculator is prompting you to enter a value for x .

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Example Two (continued)




Press 3. Then, press ENTER.

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Example Two (continued)



The image shows a TI-84 Plus C Silver Edition calculator on the left. The screen is blank. To the right of the calculator is a white box with a grey border containing the text for Example 2. Below the box is a pink bar with the text 'Images used with permission by Texas Instruments Incorporated.'

Example 2

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

$$t(3) = -1$$

Images used with permission by Texas Instruments Incorporated.

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, $t(3) = -1$.

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Self-Check 1

 **Self-Check**

Enter your answer in the box below, and then click submit.
Give your answer in simplest form.

Given: $g(x) = -5x^2 + 3x + 4$

$g(1) =$

SUBMIT

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

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Self-Check 1: Answer

Correct

That's correct!

To find $g(1)$, begin by substituting 1 for x .

Then, simplify the expression on the right side of the equation.

$$g(x) = -5x^2 + 3x + 4$$
$$g(1) = -5(1)^2 + 3(1) + 4$$
$$= -5 + 3 + 4$$
$$g(1) = 2$$

Continue


SUBMIT

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

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Self-Check 2

 **Self-Check**

Enter your answer in the box below, and then click submit.
Give your answer in simplest form.

Given: $h(x) = 5x^2 - 6x + 9$
Find $h(5)$, graphically.

$h(5) =$

SUBMIT

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

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Self-Check 2: Answer

Correct

That's correct!

Plot1 Plot2 Plot3
Y1 X²-6X+9
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=

Press the **Y=** key. Enter the expression $5x^2 - 6x + 9$ to the right of Y1.

Press **GRAPH**. Now that you have graphed the function, you can find $h(5)$.

Part One Part Two Part Three Continue

SUBMIT

Correct

CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx

Press **2nd**. Then, press the **TRACE** key. Press **1** to access the value option.

Press **5**. Then, press **ENTER**.

Part One Part Two Part Three Continue

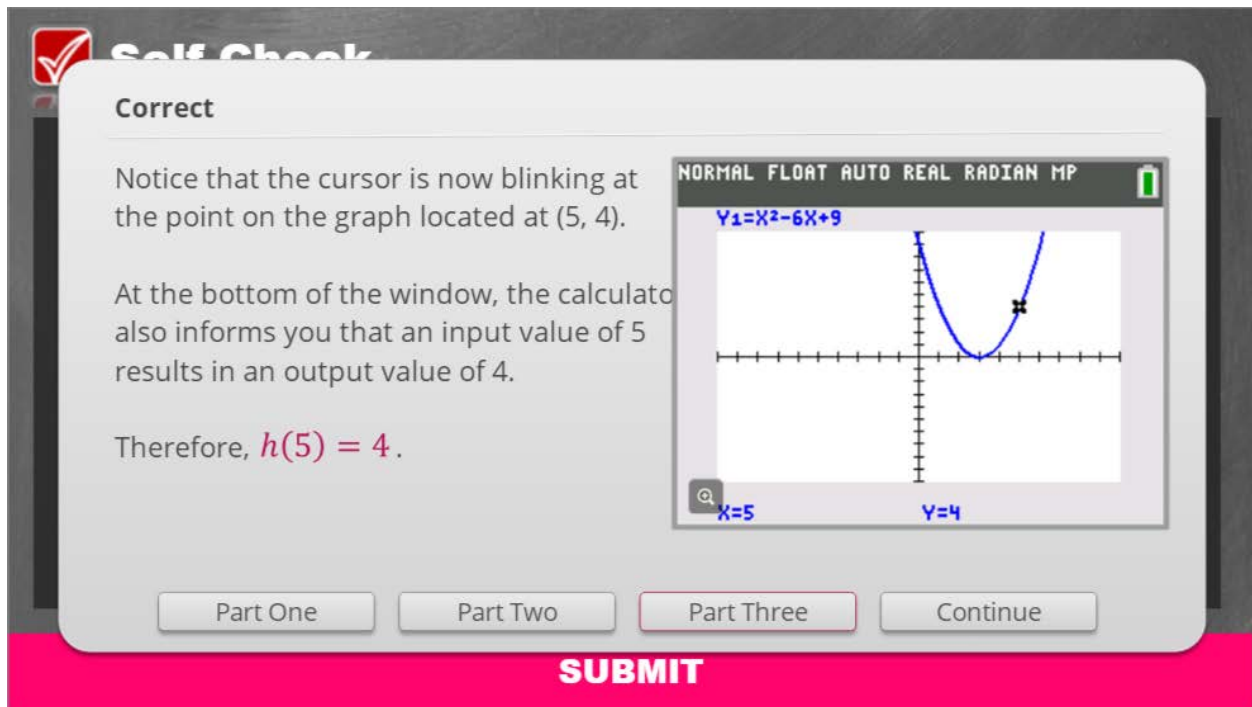
SUBMIT

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

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Self-Check 2: Answer (continued)



Correct

Notice that the cursor is now blinking at the point on the graph located at (5, 4).

At the bottom of the window, the calculator also informs you that an input value of 5 results in an output value of 4.

Therefore, $h(5) = 4$.

Y1=X²-6X+9

X=5 **Y=4**

Part One Part Two **Part Three** Continue

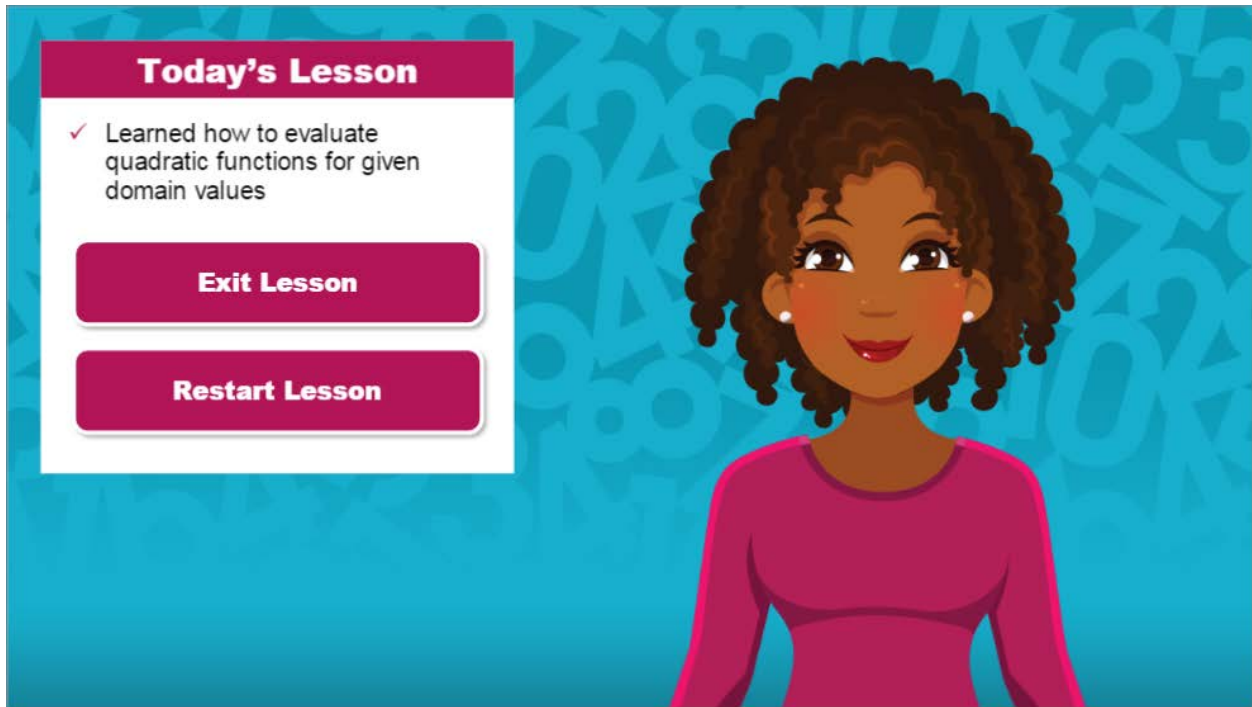
SUBMIT

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

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Conclusion



The image shows a digital interface for a lesson conclusion. On the left, a white box with a pink header titled "Today's Lesson" contains a checkmark and the text "Learned how to evaluate quadratic functions for given domain values". Below this are two pink buttons: "Exit Lesson" and "Restart Lesson". On the right, a cartoon illustration of a woman with curly brown hair and a pink top is set against a blue background with faint mathematical symbols.

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