

# Basic Algebra 2

We know when students are just beginning their study of algebra, the basic concepts can be difficult to grasp. These activities are written for teachers to use in their basic algebra classes.

When you find other helpful exercises, add these to your own eActivities.

Good exercises encourage students!

**This file includes eActivities on:**

- 1 Variable Calculation** – Substitute the number to the variable.
- 2 Expression with Variable** – Expand the expression, checking your work with Verify.
- 3 Product 1** – Find the product of the examples.
- 4 Product 2** – Verify will help keep you on the right track.
- 5 Proportion** – Do you know how to solve for x when dealing with proportions?
- 6 Factoring** – Practice factoring with Verify.
- 7 Factoring & Root** – Utilize Verify along with Analysis/G-Solve/Root in the Graph application.
- 8 Polynomial Remainder** – Find the remainder in these examples.

## 1 Variable Calculation

Substitute the number to the variable.

The image shows two side-by-side screenshots of a software application window titled 'Use Variable for Calculation'. The window has a menu bar with 'File', 'Edit', 'Insert', and 'Action'. Below the menu bar is a toolbar with various icons. The main content area contains the following text:

**Use Variable for Calculation**

<Example>  
Store the number to the variable.  
2 → x  
8 → y  
Substitute the number to the variable.  
x + 2y  
= 2 + 2 × 8  
= 2 + 16  
= 18

Calculator Example

Hint for CAS

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The second screenshot shows the same window with the following text:

Substitute the number to the variable.  
x + 2y  
= 2 + 2 × 8  
= 2 + 16  
= 18

Calculator Example

Hint for CAS

**Try your exercises.**  
When x=15, y=9,  
x + y = ?  
5x - 6y = ?  
x × y - 3x / y = ?

Calculator

Alg Standard Real Rad

## 2 Expression with Variable

Expand the expression, checking your work with Verify.

The image shows a screenshot of a software application window titled 'Expression with Variable'. The window has a menu bar with 'File', 'Edit', 'Insert', and 'Action'. Below the menu bar is a toolbar with various icons. The main content area contains the following text:

**Expression with Variable**

<Example>  
Expand the expression.  
2(3 + x)  
= 2 · 3 + 2 · x  
= 6 + 2 · x

**Try your exercise.**  
(x - 4) · 7 = ?  
Ex-1  f(x) =

(6x + 4) / 2 = ?  
Ex-2  f(x) =

2(6x - 4) / 4 = ?

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### 3 Product 1

Find a product using the distributive property.

The image shows two screenshots of a TI-84 Plus calculator interface. The left screenshot displays the following content:

**Product 1**

<Example>  
 $x \cdot (x-2)$   
 $=x \cdot x - x \cdot 2$   
 $=x^2 - 2 \cdot x$

$(4+\sqrt{5})(6-\sqrt{5})$   
 $=4 \cdot (6-\sqrt{5}) + \sqrt{5} \cdot (6-\sqrt{5})$   
 $=24 - 4\sqrt{5} + 6\sqrt{5} - \sqrt{5} \cdot \sqrt{5}$   
 $=24 + 2 \cdot \sqrt{5} - 5$   
 $=19 + 2 \cdot \sqrt{5}$

**Try your own.**  
 $(4+\sqrt{3})(6+\sqrt{3}) = ?$

The right screenshot displays the same content as the left, but with the following additions:

$(x-1)(x-2) = ?$   
 Ex-1      f(θ)=

$(x-1)(x-2) = ?$   
 Ex-2      f(θ)=

$(x+3)(1-2x) = ?$   
 Ex-3      f(θ)=

### 4 Product 2

Verify will help keep you on the right track.

The image shows two screenshots of a TI-84 Plus calculator interface. The left screenshot displays the following content:

**Product 2**

<Example>  
 $(x+1)^2$   
 $=(x+1) \cdot (x+1)$   
 $=x \cdot (x+1) + 1 \cdot (x+1)$   
 $=x \cdot x + x + x + 1$   
 $=x^2 + 2 \cdot x + 1$

$(x+1)(x-1)$   
 $=x \cdot (x-1) + 1 \cdot (x-1)$   
 $=x^2 - x + x - 1$   
 $=x^2 - 1$

**Try your own.**  
 $(x-3)^2 = ?$

The right screenshot displays the same content as the left, but with the following additions:

$x \cdot (x-1) + 1 \cdot (x-1)$   
 $=x^2 - x + x - 1$   
 $=x^2 - 1$

**Try your own.**  
 $(x-3)^2 = ?$   
 Ex-1      f(θ)=

$(2x+3)^2 = ?$   
 Ex-2      f(θ)=

$(3x - \frac{1}{2})(3x + \frac{1}{2}) = ?$   
 Ex-3      f(θ)=

### 5 Proportion

Do you know how to solve for x when dealing with proportions?

File Edit Insert Action

Proportion

<Example>

When  $24:x=12:50$ ,  $\frac{24}{x} = \frac{12}{50}$

Calculator

Another way;  $24 \times 50 = x \times 12$

Calculator

**Try your own.**

$36:x=12:60$ ,  $x=?$

Ex-1

$x:20=12:60$ ,  $x=?$

Ex-2

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File Edit Insert Action

Calculator

Another way;  $24 \times 50 = x \times 12$

Calculator

**Try your own.**

$36:x=12:60$ ,  $x=?$

Ex-1

$x:20=12:60$ ,  $x=?$

Ex-2

$55:20=x:60$ ,  $x=?$

Ex-3

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## 6 Factoring

Practice factoring with Verify.

File Edit Insert Action

Factoring

<Example>

$2x^2+14x$   
 $=2 \cdot x \cdot x + 2 \cdot x \cdot 7$   
 $=2 \cdot x \cdot (x+7)$

$x^2-5x+6$   
 $=x^2-3 \cdot x-2 \cdot x+6$   
 $=(x-3) \cdot (x-2)$

$2x^2+5x-12$   
 $=2 \cdot x^2+5 \cdot x-3 \cdot 4$   
 $=(2 \cdot x-3) \cdot (x+4)$

**Try your own.**

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File Edit Insert Action

$2x^2+5x-12$   
 $=2 \cdot x^2+5 \cdot x-3 \cdot 4$   
 $=(2 \cdot x-3) \cdot (x+4)$

**Try your own.**

$7 \cdot x^2-14 \cdot x = ?$

Ex-1

$x^2+4 \cdot x-12 = ?$

Ex-2

$6x^2+x-1 = ?$

Ex-3

Alg Standard Cplx Rad

## 7 Factoring and Root

Utilize Verify along with Analysis/G-Solve/Root in the Graph application.

File Edit Insert Action

Factoring and Root

<Example>

$x^2+7x+12$   
 $=x^2+(3+4) \cdot x+12$   
 $=(x+3) \cdot (x+4)$

Graph  $y=x^2+7x+12$

Tap  
 Analysis/G-Solve/Root.  
 You find the roots are -3  
 and -4.

**Try your own.**

$x^2+x-2 = ?$

Ex-1 Calculator

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File Edit Insert Action

Graph  $y=x^2+7x+12$

Tap  
 Analysis/G-Solve/Root.  
 You find the roots are -3  
 and -4.

**Try your own.**

$x^2+x-2 = ?$

Ex-1 Calculator

Ex-1 Graph

$x^2-2 = ?$

Ex-2 Calculator

Ex-2 Graph

Alg Standard Cplx Rad

## 8 Polynomial (Remainder)

Find the remainder in these examples.

<p>File Edit Insert Action</p> <p><b>Polynomial (Remainder)</b></p> <p>&lt;Example&gt; Find the remainder. <math display="block">\frac{x^2+3 \cdot x-15}{x-3}</math></p> <p>Change the expression. <math display="block">x^2+3 \cdot x-15</math> <math display="block">=x^2+(6-3) \cdot x-15</math> <math display="block">=(x+6) \cdot (x-3)+18-15</math> <math display="block">=(x+6) \cdot (x-3)+3</math> Then the remainder is 3.</p> <p>Hint to use CAS</p> <p>Alg Standard Real Rad</p>	<p>File Edit Insert Action</p> <p><math display="block">=x^2+(6-3) \cdot x-15</math> <math display="block">=(x+6) \cdot (x-3)+18-15</math> <math display="block">=(x+6) \cdot (x-3)+3</math> Then the remainder is 3.</p> <p>Hint to use CAS</p> <p><b>Try your own.</b></p> <p><math display="block">\frac{x^2-2 \cdot x-15}{x-3}</math>, remainder=?</p> <p>Ex-1 <input type="text"/> f(x)=</p> <p><math display="block">\frac{x^2-2 \cdot x-15}{x+2}</math>, remainder=?</p> <p>Ex-2 <input type="text"/> f(x)=</p> <p>Alg Standard Real Rad</p>
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