

# Basic Rational

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 **Repeating Decimal** – Rational numbers as a repeating decimal and vice versa.
- 2 **Rational Number +-** – Look at the example and then try the exercises.
- 3 **Rational Number X/** – Another example and more exercises to try.
- 4 **Graph  $y=k/x$**  – Watch the graph change as you modify the rational equation.
- 5 **Ratio\_Eqn +-** – Simplify and then check with Verify.
- 6 **Ratio\_Eqn X/** – Once again, simplify and then check with Verify.
- 7 **Solve RatioEqn** – Solve for x, following the examples and then try the exercises.
- 8 **Division by Poly** – Take your turn at finding the remainder with these exercises.

## Repeating Decimal

Rational numbers as a repeating decimal and vice versa.

**Rational Number**  
<Repeating Decimal>

<Example>  
 $\frac{12}{99}, \frac{123}{999}$  can be written  
 as a repeating decimal.

Calculator

**Try your own.**  
 $\frac{234}{999} = ?$   
 $0.4545454545 = \frac{?}{?}$   
 $1.4545454545 = \frac{?}{?}$

Calculator

Alg Decimal Real Deg

**Rational Number**  
<Repeating Decimal>

<Example>  
 $\frac{12}{99}, \frac{123}{999}$  can be written  
 as a repeating decimal.

Calculator

$\frac{12}{99}$                     0.1212121212  
 $\frac{123}{999}$                     0.1231231231  
 0

Alg Decimal Real Deg

## Rational Number + -

Look at the example and then try the exercises.

**Rational Number** × /

<Example>  
 $\frac{1}{3} \times \frac{2}{5} / \frac{1}{2}$   
 $= \frac{1 \cdot 2 \cdot 2}{3 \cdot 5 \cdot 1}$   
 $= \frac{4}{15}$

**Try your own.**  
 $\frac{1}{3} / \frac{2}{5} \times \frac{1}{2} = ?$   
 Ex-1  f(=)

$\frac{1}{3} + \frac{2}{5} \times \frac{1}{2} = ?$   
 Ex-2  f(=)

$\frac{1}{3} \times \frac{2}{5} / \frac{1}{2} = ?$   
 Ex-3  f(=)

$\frac{1}{3} + \frac{2}{5} \times \frac{1}{2} = ?$   
 Ex-4  f(=)

Alg Standard Real Deg

**Try your own.**  
 $\frac{1}{3} / \frac{2}{5} \times \frac{1}{2} = ?$   
 Ex-1  f(=)

$\frac{1}{3} + \frac{2}{5} \times \frac{1}{2} = ?$   
 Ex-2  f(=)

$\frac{1}{3} \times \frac{2}{5} / \frac{1}{2} = ?$   
 Ex-3  f(=)

$\frac{1}{3} + \frac{2}{5} \times \frac{1}{2} = ?$   
 Ex-4  f(=)

Alg Standard Real Deg

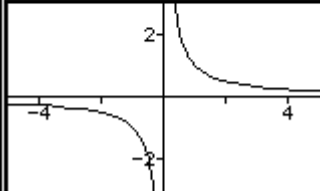
## Rational Number X /

Another example and more exercises to try.

<p><b>Rational Number x /</b></p> <p>&lt;Example&gt;  <math>\frac{1}{3} \times \frac{2}{5} / \frac{1}{2}</math>  <math>= \frac{1 \cdot 2 \cdot 2}{3 \cdot 5 \cdot 1}</math>  <math>= \frac{4}{15}</math></p> <p><b>Try your own.</b>  <math>\frac{1}{3} / \frac{2}{5} \times \frac{1}{2} = ?</math></p> <p>Ex-1 <input type="text"/> f(θ) =</p> <p><math>\frac{1}{3} + \frac{2}{5} \times \frac{1}{2} = ?</math></p>	<p><b>Try your own.</b>  <math>\frac{1}{3} / \frac{2}{5} \times \frac{1}{2} = ?</math></p> <p>Ex-1 <input type="text"/> f(θ) =</p> <p><math>\frac{1}{3} + \frac{2}{5} \times \frac{1}{2} = ?</math></p> <p>Ex-2 <input type="text"/> f(θ) =</p> <p><math>\frac{1}{3} / \frac{2}{5} + \frac{1}{2} = ?</math></p> <p>Ex-3 <input type="text"/> f(θ) =</p> <p><math>\frac{1}{3} \times \frac{2}{5} / \frac{1}{2} = ?</math></p> <p>Ex-4 <input type="text"/> f(θ) =</p>
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## Graph y=k/x

Watch the graph change as you modify the rational equation.

<p><b>Graph y=k/x</b></p> <p><math>y = \frac{1}{x}</math></p> <p>Open the window--&gt; <input type="button" value="Graph"/></p> <p>Change the equation and tap EXE to change the graph.</p> <p><math>y = \frac{1}{x}</math></p>	<p><b>Graph y=k/x</b></p> <p><math>y = \frac{1}{x}</math></p> <p>Open the window--&gt; <input type="button" value="Graph"/></p> <p>Change the equation and tap EXE to change the</p> 
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## Rational Equation + -

Simplify and then check with Verify.

<p><b>Adding and Subtracting</b></p> <p>&lt;Example&gt;  Simplify it.  <math>\frac{1}{x} + \frac{1}{x+2}</math>  <math>= \frac{x+2}{x \cdot (x+2)} + \frac{x}{x \cdot (x+2)}</math>  <math>= \frac{x+2+x}{x \cdot (x+2)}</math>  <math>= \frac{2 \cdot x+2}{x \cdot (x+2)}</math></p> <p><math>\frac{1}{x^2} - \frac{1}{3x}</math></p>	<p><b>Try your own.</b>  Simplify it.  <math>\frac{2}{x} - \frac{2}{x+2} = ?</math></p> <p>Ex-1 <input type="text"/> f(θ) =</p> <p><math>\frac{2}{x^2} + \frac{2}{3x} = ?</math></p> <p>Ex-2 <input type="text"/> f(θ) =</p> <p><math>\frac{2}{x} - \frac{2}{x+2} + \frac{2}{3x} = ?</math></p> <p>Ex-3 <input type="text"/> f(θ) =</p>
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## Rational Equation X /

Once again, simplify and then check with Verify.

<p><b>Multiplying and Dividing</b></p> <p>&lt;Example&gt; Simplify it.</p> $\frac{1}{x+2} \cdot \frac{1}{2x+4}$ $= \frac{1}{(x+2) \cdot (2 \cdot x+4)}$ $= \frac{1}{2 \cdot (x+2) \cdot (x+2)}$ $= \frac{1}{2 \cdot (x+2)^2}$ $\frac{1}{2} \div \frac{1}{3x}$	<p><b>Try your own.</b></p> $\frac{1}{x+2} \div \frac{1}{2x+4} = ?$ <p>Ex-1 <input type="text"/> f(θ)=</p> $\frac{1}{x^2} \times \frac{1}{3x} = ?$ <p>Ex-2 <input type="text"/> f(θ)=</p> $\frac{1}{x+2} \times \frac{1}{2x+4} \div \frac{1}{x^2} \div \frac{1}{3x} = ?$ <p>Ex-3 <input type="text"/> f(θ)=</p>
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## Solve Rational Equation

Solve for x, following the examples and then try the exercises.

<p><b>Solve Rational Equation</b></p> $8 = \frac{2+3x}{1-x}$ <p>Calculator <input type="text"/> <input type="button" value="√(C)"/></p> <p>Check! <math>x \neq 1</math>.</p> $\frac{5}{2x} + \frac{1}{2x+1} = \frac{4}{x}$ <p>Calculator <input type="text"/> <input type="button" value="√(C)"/></p> <p>Check! <math>x \neq 0, x \neq 1/2</math>.</p> $\frac{3}{x-2} \div \frac{x-1}{x+2} = 1$ <p>Calculator <input type="text"/> <input type="button" value="√(C)"/></p>	<p><b>Try your own.</b></p> $6 = \frac{3x-1}{x-2}, x = ?$ <p>Ex-1 <input type="text"/> <input type="button" value="√(C)"/></p> $\frac{-5}{2x} + \frac{3}{2x+1} = \frac{4}{x}, x = ?$ <p>Ex-2 <input type="text"/> <input type="button" value="√(C)"/></p> $\frac{2}{x-3} \times \frac{x-1}{x+2} = 1, x = ?$ <p>Ex-3 <input type="text"/> <input type="button" value="√(C)"/></p>
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## Division by Polynomial

Take your turn at finding the remainder with these exercises.

<p><b>Division by Polynomial</b></p> <p>&lt;Example&gt; Find the Remainder for</p> $\frac{x^2+2x-12}{x-3}$ <p>Calculator <input type="text"/> f(θ)=</p> <p>The remainder is 3.</p> <p>Check! <input type="button" value="√(C)"/></p> <p><b>Try your own.</b> Find the Remainder for</p> $\frac{x^2-x-12}{x-3}, Rm = ?$ <p>Ex-1 <input type="text"/> f(θ)=</p>	<p><b>Try your own.</b> Find the Remainder for</p> $\frac{x^2-x-12}{x-3}, Rm = ?$ <p>Ex-1 <input type="text"/> f(θ)=</p> $\frac{2x^2+2x-12}{x+3}, Rm = ?$ <p>Ex-2 <input type="text"/> f(θ)=</p> $\frac{2x^2+2x-12}{x-2}, Rm = ?$ <p>Ex-3 <input type="text"/> f(θ)=</p>
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