# Algebra II Lesson #3 Unit 11 Class Worksheet #3 For Worksheets #4 - #6

## This lesson will begin with a discussion about solving exponential equations.

1.  $8^{(3x+1)} = 16$ 2.  $125^{(2x-1)} = 25^{(x+1)}$ 

3. 
$$5^{(2x-3)} = 3$$
  
4.  $2^{(3x+2)} = e^{(x+1)}$ 

- 1.  $8^{(3x+1)} = 16$ 2.  $125^{(2x-1)} = 25^{(x+1)}$
- 3.  $5^{(2x-3)} = 3$ 4.  $2^{(3x+2)} = e^{(x+1)}$

Notice how these equations are set up.

- 1.  $8^{(3x+1)} = 16$ 2.  $125^{(2x-1)} = 25^{(x+1)}$
- 3.  $5^{(2x-3)} = 3$ 4.  $2^{(3x+2)} = e^{(x+1)}$

Notice how these equations are set up. We are solving for x.

- 1.  $8^{(3x+1)} = 16$ 2.  $125^{(2x-1)} = 25^{(x+1)}$
- 3.  $5^{(2x-3)} = 3$ 4.  $2^{(3x+2)} = e^{(x+1)}$

Notice how these equations are set up. We are solving for x. In these equations the exponents are algebraic expressions in terms of x.

- 1.  $8^{(3x+1)} = 16$ 2.  $125^{(2x-1)} = 25^{(x+1)}$
- 3.  $5^{(2x-3)} = 3$ 4.  $2^{(3x+2)} = e^{(x+1)}$

Notice how these equations are set up. We are solving for x. In these equations the exponents are algebraic expressions in terms of x. These equations are called 'exponential equations'.

- 1.  $8^{(3x+1)} = 16$ 2.  $125^{(2x-1)} = 25^{(x+1)}$
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Notice how these equations are set up. We are solving for x. In these equations the exponents are algebraic expressions in terms of x. These equations are called 'exponential equations'. We will be using two methods to solve exponential equations.

- 1.  $8^{(3x+1)} = 16$ 2.  $125^{(2x-1)} = 25^{(x+1)}$
- 3.  $5^{(2x-3)} = 3$ 4.  $2^{(3x+2)} = e^{(x+1)}$

Notice how these equations are set up. We are solving for x. In these equations the exponents are algebraic expressions in terms of x. These equations are called 'exponential equations'. We will be using two methods to solve exponential equations. We will use the <u>common base</u> <u>method</u> to solve the first two equations.

- 1.  $8^{(3x+1)} = 16$ 2.  $125^{(2x-1)} = 25^{(x+1)}$
- 3.  $5^{(2x-3)} = 3$ 4.  $2^{(3x+2)} = e^{(x+1)}$

Notice how these equations are set up. We are solving for x. In these equations the exponents are algebraic expressions in terms of x. These equations are called 'exponential equations'. We will be using two methods to solve exponential equations. We will use the <u>common base method</u> to solve the first two equations. We will use <u>logarithms</u> to solve the last two equations.

Use the common base method to solve each of the equations.

1.  $8^{(3x+1)} = 16$ 2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Use the common base method to solve each of the equations.

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2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Use the **common base** method to solve each of the equations.

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Use the **common base** method to solve each of the equations.

1.  $8^{(3x+1)} = 16$ 

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the **common base** method to solve each of the equations.

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

1.  $8^{(3x+1)} = 16$ 

**[2<sup>3</sup>]** 

Use the **common base** method to solve each of the equations.

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

1.  $8^{(3x+1)} = 16$ [2<sup>3</sup>]<sup>(3x+1)</sup>

Use the **common base** method to solve each of the equations.

1.  $8^{(3x+1)} = 16$ [2<sup>3</sup>]<sup>(3x+1)</sup>= 2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the **common base** method to solve each of the equations.

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

1.  $8^{(3x+1)} = 16$ [2<sup>3</sup>]<sup>(3x+1)</sup> = 2<sup>4</sup>

Use the **common base** method to solve each of the equations.

1.  $8^{(3x+1)} = 16$ [2<sup>3</sup>]<sup>(3x+1)</sup> = 2<sup>4</sup> 2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the **common base** method to solve each of the equations.

1.  $8^{(3x+1)} = 16$ 

 $[2^3]^{(3x+1)} = 2^4$ 

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

1.  $8^{(3x+1)} = 16$   $[2^3]^{(3x+1)} = 2^4$  $2^{(3x+1)} = 2^4$  2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

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Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

1. $8^{(3x+1)} = 16$	
$[2^3]^{(3x+1)} = 2^4$	
$2^{(9x+3)} = 2^4$	
9x + 3	

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

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The exponents are equal. Solve the equation g = h.
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Use the **common base** method to solve each of the equations.

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

1. $8^{(3x+1)} = 16$	
$[2^3]^{(3x+1)} = 2^4$	
$2^{(9x+3)} = 2^4$	
9x + 3 = 4	

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

1. $8^{(3x+1)} = 16$
$[2^3]^{(3x+1)} = 2^4$
$2^{(9x+3)} = 2^4$
9x + 3 = 4
9x

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

1. $8^{(3x+1)} = 16$
$[2^3]^{(3x+1)} = 2^4$
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9x + 3 = 4
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2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

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Use the **common base** method to solve each of the equations.

1. $8^{(3x+1)} = 16$
$[2^3]^{(3x+1)} = 2^4$
$2^{(9x+3)} = 2^4$
$9_{\rm X} + 3 = 4$
9x = 1

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

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$[2^3]^{(3x+1)} = 2^4$	
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$9_{\rm X} + 3 = 4$	
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X	

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$[2^3]^{(3x+1)} = 2^4$
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9x + 3 = 4
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2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Use the **common base** method to solve each of the equations.

1. $8^{(3x+1)} = 16$
$[2^3]^{(3x+1)} = 2^4$
$2^{(9x+3)} = 2^4$
9x + 3 = 4
9x = 1
x = 1/9

Each side of the equation can be expressed as a power of 2.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

1. 
$$8^{(3x+1)} = 16$$
  
 $[2^3]^{(3x+1)} = 2^4$   
 $2^{(9x+3)} = 2^4$   
 $9x + 3 = 4$   
 $9x = 1$   
 $x = 1/9$ 

2.  $125^{(2x-1)} = 25^{(x+1)}$ 

Use the **common base** method to solve each of the equations.

$$8^{(3x+1)} = 16$$

$$2 \cdot 125^{(2x-1)} = 25^{(x+1)}$$

$$2^{(9x+3)} = 2^{4}$$

$$9x + 3 = 4$$

$$9x = 1$$

$$x = 1/9$$

Use the **common base** method to solve each of the equations.

1. 
$$8^{(3x+1)} = 16$$
  
 $[2^3]^{(3x+1)} = 2^4$   
 $2^{(9x+3)} = 2^4$   
 $9x + 3 = 4$   
 $9x = 1$   
 $x = 1/9$   
2.  $125^{(2x-1)} = 25^{(x)}$ 

Each side of the equation can be expressed as a power of 5.

+1)

Use the **common base** method to solve each of the equations.

$$8^{(3x+1)} = 16$$

$$2^{(3x+1)} = 2^{4}$$

$$2^{(9x+3)} = 2^{4}$$

$$9x + 3 = 4$$

$$9x = 1$$

$$x = 1/9$$

$$2^{(3x+1)} = 2^{(2x-1)} = 2^{(x+1)}$$

$$[5^{3}]$$

Use the **common base** method to solve each of the equations.

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$$8^{(3x+1)} = 16$$
  
 $[2^3]^{(3x+1)} = 2^4$   
 $2^{(9x+3)} = 2^4$   
 $9x + 3 = 4$   
 $9x = 1$   
 $x = 1/9$ 

2.  $125^{(2x-1)} = 25^{(x+1)}$ [5<sup>3</sup>]<sup>(2x-1)</sup>

Use the **common base** method to solve each of the equations.

$$8^{(3x+1)} = 16$$

$$[2^{3}]^{(3x+1)} = 2^{4}$$

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$$9x = 1$$

$$x = 1/9$$

2.  $125^{(2x-1)} = 25^{(x+1)}$ [5<sup>3</sup>]<sup>(2x-1)</sup>=

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2. 
$$125^{(2x-1)} = 25^{(x+1)}$$
  
[5<sup>3</sup>]<sup>(2x-1)</sup> = [5<sup>2</sup>]

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Each side of the equation can be expressed as a power of 5.

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$$125^{(2x-1)} = 25^{(x+1)}$$
  
 $[5^3]^{(2x-1)} = [5^2]^{(x+1)}$   
 $5^{(x+1)}$ 

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 $5^{(6x-3)}$ 

Each side of the equation can be expressed as a power of 5.

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Each side of the equation can be expressed as a power of 5.

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 $5^{(6x-3)} = 5^{(2x+2)}$ 

Each side of the equation can be expressed as a power of 5.

Use the **common base** method to solve each of the equations.

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 $[5^3]^{(2x-1)} = [5^2]^{(x+1)}$   
 $5^{(6x-3)} = 5^{(2x+2)}$ 

Each side of the equation can be expressed as a power of 5.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

$1. \ 8^{(3x+1)} = 16$
$[2^3]^{(3x+1)} = 2^4$
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 $5^{(6x-3)} = 5^{(2x+2)}$   
 $6x - 3$ 

Each side of the equation can be expressed as a power of 5.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

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Each side of the equation can be expressed as a power of 5.

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Use the **common base** method to solve each of the equations.

1. $8^{(3x+1)} = 16$	2. $125^{(2x-1)} = 25^{(x+1)}$
$[2^3]^{(3x+1)} = 2^4$	$[5^3]^{(2x-1)} = [5^2]^{(x+1)}$
$2^{(9_x+3)}=2^4$	$5^{(6x-3)} = 5^{(2x+2)}$
9x + 3 = 4	$6\mathbf{x} - 3 = 2\mathbf{x} + 2$
9x = 1	
x = 1/9	

Each side of the equation can be expressed as a power of 5.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

$1. \ 8^{(3x+1)} = 16$	2. $125^{(2x-1)} = 25^{(x+1)}$
$[2^3]^{(3x+1)} = 2^4$	$[5^3]^{(2x-1)} = [5^2]^{(x+1)}$
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9x + 3 = 4	$6\mathbf{x} - 3 = 2\mathbf{x} + 2$
$9_{\rm X} = 1$	<b>4x</b>
x = 1/9	

Each side of the equation can be expressed as a power of 5.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

$1. \ 8^{(3x+1)} = 16$	2. $125^{(2x-1)} = 25^{(x+1)}$
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$9_{\rm X} = 1$	<b>4x</b> =
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Each side of the equation can be expressed as a power of 5.

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9x + 3 = 4	$6\mathbf{x} - 3 = 2\mathbf{x} + 2$
$9_{\rm X} = 1$	$4\mathbf{x} = 5$
x = 1/9	

Each side of the equation can be expressed as a power of 5.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

$1. \ 8^{(3x+1)} = 16$	2. $125^{(2x-1)} = 25^{(x+1)}$
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9x + 3 = 4	$6\mathbf{x} - 3 = 2\mathbf{x} + 2$
$9_{\rm X} = 1$	$4\mathbf{x} = 5$
x = 1/9	X

Each side of the equation can be expressed as a power of 5.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

$1. \ 8^{(3x+1)} = 16$	2. $125^{(2x-1)} = 25^{(x+1)}$
$[2^3]^{(3x+1)} = 2^4$	$[5^3]^{(2x-1)} = [5^2]^{(x+1)}$
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9x + 3 = 4	$6\mathbf{x} - 3 = 2\mathbf{x} + 2$
$9_{\rm X} = 1$	$4\mathbf{x} = 5$
x = 1/9	<b>x</b> =

Each side of the equation can be expressed as a power of 5.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

$1. \ 8^{(3x+1)} = 16$	2. $125^{(2x-1)} = 25^{(x+1)}$
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$2^{(9x+3)} = 2^4$	$5^{(6x-3)} = 5^{(2x+2)}$
9x + 3 = 4	$6\mathbf{x} - 3 = 2\mathbf{x} + 2$
$9_{\rm X}=1$	$4\mathbf{x} = 5$
x = 1/9	x = 5/4

Each side of the equation can be expressed as a power of 5.

Use the properties of exponents to express the equation in the form  $B^g = B^h$ .

Use the **common base** method to solve each of the equations.

$1. \ 8^{(3x+1)} = 16$	2. $125^{(2x-1)} = 25^{(x+1)}$
$[2^3]^{(3x+1)} = 2^4$	$[5^3]^{(2x-1)} = [5^2]^{(x+1)}$
$2^{(9x+3)} = 2^4$	$5^{(6x-3)} = 5^{(2x+2)}$
9x + 3 = 4	$6\mathbf{x} - 3 = 2\mathbf{x} + 2$
9x = 1	$4\mathbf{x} = 5$
$\mathbf{x} = 1/9$	$\mathbf{x} = 5/4$

Use the common base method to solve each of the equations.

1. $8^{(3x+1)} = 16$	2. $125^{(2x-1)} = 25^{(x+1)}$
$[2^3]^{(3x+1)} = 2^4$	$[5^3]^{(2x-1)} = [5^2]^{(x+1)}$
$2^{(9x+3)} = 2^4$	$5^{(6x-3)} = 5^{(2x+2)}$
9x + 3 = 4	$6\mathbf{x} - 3 = 2\mathbf{x} + 2$
$9\mathbf{x} = 1$	$4\mathbf{x} = 5$
x = 1/9	$\mathbf{x} = 5/4$

Use logarithms to solve each of the equations. Express your answers rounded to the nearest hundredth.

3. 
$$5^{(2x-3)} = 3$$
  
4.  $2^{(3x+2)} = e^{(x+1)}$ 

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Take the log of both sides of the equation. Apply the 'power rule' of logarithms.

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Take the log of both sides of the equation. Apply the 'power rule' of logarithms. Divide each side by 3log 2 – log e.

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Common logarithms were used when solving these problems.

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Common logarithms were used when solving these problems. Natural logarithms would have worked as well.

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Common logarithms were used when solving these problems. Natural logarithms would have worked as well. What follows are these two problem done using natural logarithms for comparison.

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 $2x \log 5 - 3\log 5 = \log 3$   
 $2x \log 5 = \log 3 + 3\log 5$   
 $x = \frac{\log 3 + 3\log 5}{2\log 5} \approx 1.84$   
3.  $5^{(2x-3)} = 3$   
 $\ln[5^{(2x-3)}] = \ln 3$   
 $(2x-3)(\ln 5) = \ln 3$   
 $2x \ln 5 - 3\ln 5 = \ln 3$   
 $2x \ln 5 = \ln 3 + 3\ln 5$   
 $x = \frac{\ln 3 + 3\ln 5}{2\ln 5} \approx 1.84$ 

Use logarithms to solve each of the equations. Express your answers rounded to the nearest hundredth.

4. 
$$2^{(3x+2)} = e^{(x+1)}$$
  
 $log[2^{(3x+2)}] = log[e^{(x+1)}]$   
 $(3x+2)(log 2) = (x+1)(log e)$   
 $3x log 2 + 2log 2 = x log e + log e$   
 $3x log 2 - x log e = log e - 2log 2$   
 $(3log 2 - log e)x = log e - 2log 2$   
 $x = \frac{log e - 2log 2}{3log 2 - log e} \approx -0.36$ 

4. 
$$2^{(3x+2)} = e^{(x+1)}$$
  
 $\ln[2^{(3x+2)}] = \ln[e^{(x+1)}]$   
 $(3x+2)(\ln 2) = (x+1)(\ln e)$   
 $3x \ln 2 + 2\ln 2 = x + 1$   
 $3x\ln 2 - x = 1 - 2\ln 2$   
 $(3\ln 2 - 1)x = 1 - 2\ln 2$   
 $x = \frac{1 - 2\ln 2}{3\ln 2 - 1} \approx -0.36$ 

5. 
$$\log_2 x = 3$$
 6.  $\log_2 x = -3$ 

7. 
$$\log_4 x = 2.5$$
  
8.  $\log_4 x = -1.5$ 

9. 
$$\log_3 x = 1.5$$
 10.  $\log x = 0.8$ 

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
 6.  $\log_2 x = -3$ 

7.  $\log_4 x = 2.5$  8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
 6.  $\log_2 x = -3$ 

7.  $\log_4 x = 2.5$  8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

9.  $Log_3 x = 1.5$ 

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
6.  $\log_2 x = -3$   
9.  $\log_2 x = -3$ 

7.  $\log_4 x = 2.5$ 8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
 $x = 2^3$   
7.  $\log_4 x = 2.5$   
6.  $\log_2 x = -3$   
8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
 $x = 8$   
7.  $\log_4 x = 2.5$   
6.  $\log_2 x = -3$   
8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
 $x = 8$   
7.  $\log_4 x = 2.5$   
6.  $\log_2 x = -3$   
8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
 $x = 8$   
6.  $\log_2 x = -3$   
 $x = -3$ 

7.  $\log_4 x = 2.5$  8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
 $x = 8$   
6.  $\log_2 x = -3$   
 $x =$ 

7.  $\log_4 x = 2.5$ 8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
 $x = 8$   
7.  $\log_4 x = 2.5$   
6.  $\log_2 x = -3$   
 $x = 2^{-3}$   
8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
 $x = 8$   
7.  $\log_4 x = 2.5$   
6.  $\log_2 x = -3$   
 $x = 2^{-3} = 3$   
8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	

7.  $\log_4 x = 2.5$ 8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	<b>x</b> =
7. $Log_4 x = 2.5$	8. $\log_4 x = -1.5$

9.  $\log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{-3}$
$\mathbf{x} = 8$	x = 1/8
- 1	

7.  $\log_4 x = 2.5$  8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

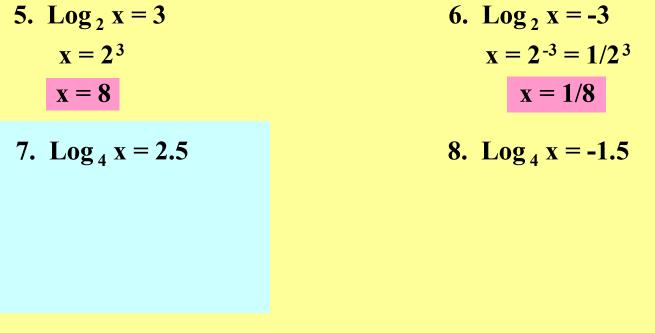
5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
 $x = 8$   
6.  $\log_2 x = -3$   
 $x = 2^{-3} = 1/2^3$   
 $x = 1/8$ 

7.  $\log_4 x = 2.5$  8.  $\log_4 x = -1.5$ 

9.  $Log_3 x = 1.5$ 

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

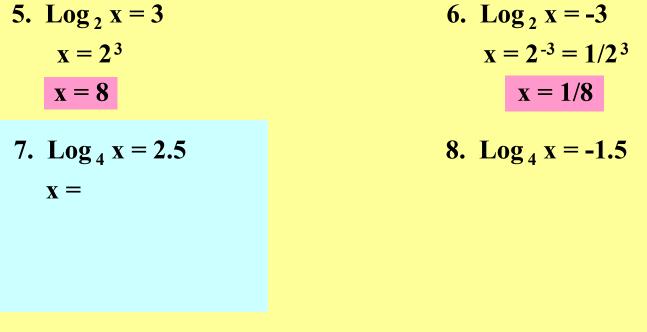
Solve for x. Express irrational solutions rounded to the nearest hundredth.



10. Log x = 0.8

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

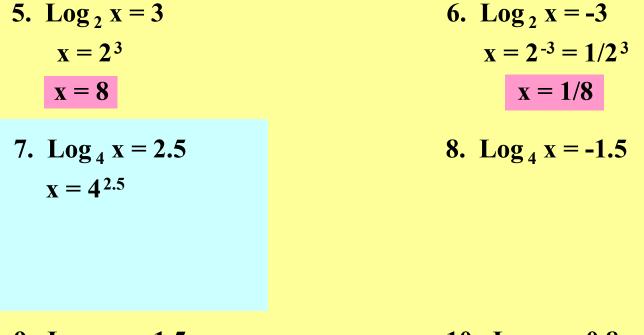
Solve for x. Express irrational solutions rounded to the nearest hundredth.



9.  $Log_3 x = 1.5$ 

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

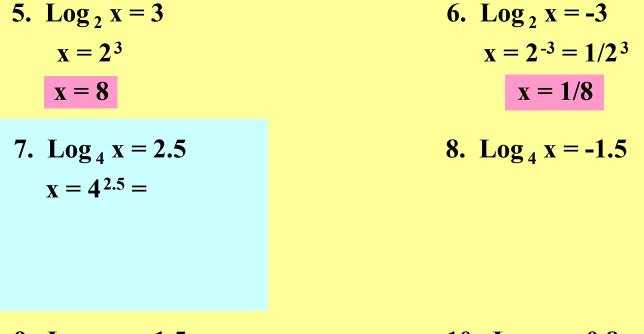
Solve for x. Express irrational solutions rounded to the nearest hundredth.



9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.



9.  $Log_3 x = 1.5$ 

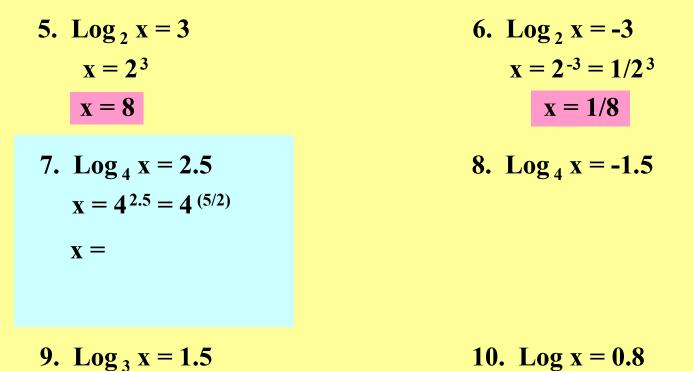
$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

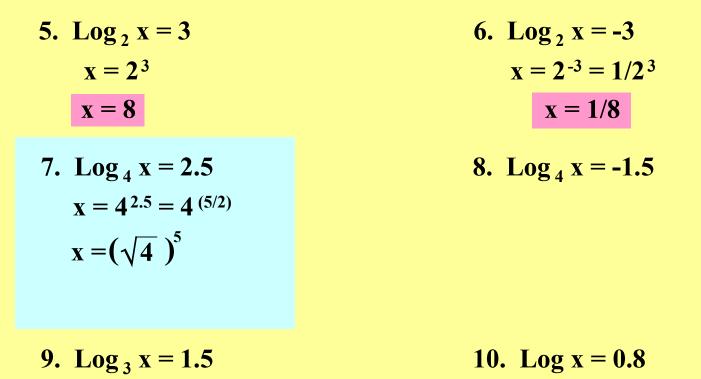


9.  $\log_3 x = 1.5$ 

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$



$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$



$$\log_B x = k$$
  $\longrightarrow$   $x = B^k$ 

5. 
$$\log_2 x = 3$$
  
 $x = 2^3$   
 $x = 8$   
7.  $\log_4 x = 2.5$   
 $x = 4^{2.5} = 4^{(5/2)}$   
 $x = (\sqrt{4})^5 =$   
9.  $\log_3 x = 1.5$   
6.  $\log_2 x = -3$   
 $x = 2^{-3} = 1/2^3$   
 $x = 1/8$   
8.  $\log_4 x = -1.5$   
10.  $\log x = 0.8$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

5. $\log_2 x = 3$ $x = 2^3$ x = 8	6. $\log_2 x = -3$ $x = 2^{-3} = 1/2^3$ x = 1/8
7. $\log_4 x = 2.5$ $x = 4^{2.5} = 4^{(5/2)}$ $x = (\sqrt{4})^5 = 2^5$	8. Log <sub>4</sub> x = -1.5
9. $\log_3 x = 1.5$	10. Log $x = 0.8$

$$\log_B x = k$$
  $\longrightarrow$   $x = B^k$ 

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{-3}$
<b>x</b> = 8	x = 1/8
7. $\log_4 x = 2.5$	8. $Log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	
$x = (\sqrt{4})^5 = 2^5$	
<b>x</b> =	

10. Log x = 0.8

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $\log_4 x = 2.5$	8. $Log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	
$x = (\sqrt{4})^5 = 2^5$	
x = 32	

10. Log x = 0.8

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

6. $\log_2 x = -3$
$x = 2^{-3} = 1/2^{3}$
x = 1/8
8. $Log_4 x = -1.5$

10. Log x = 0.8

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $Log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	
$x = (\sqrt{4})^5 = 2^5$	
$\mathbf{x} = 32$	

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	$\mathbf{x} = 1/8$
7. $Log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	<b>x</b> =
$x = (\sqrt{4})^5 = 2^5$	
$\mathbf{x} = 32$	

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $Log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	$x = 4^{-1.5}$
$x = (\sqrt{4})^5 = 2^5$	
$\mathbf{x} = 32$	

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{-3}$
$\mathbf{x} = 8$	x = 1/8
7. $\log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	$x = 4^{-1.5} =$
$x = (\sqrt{4})^5 = 2^5$	
$\mathbf{x} = 32$	

9.  $Log_3 x = 1.5$ 

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $Log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	$\mathbf{x} = 4^{-1.5} = 4^{(-3/2)}$
$x = (\sqrt{4})^5 = 2^5$	
$\mathbf{x} = 32$	

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $Log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	$\mathbf{x} = 4^{-1.5} = 4^{(-3/2)} =$
$x = (\sqrt{4})^5 = 2^5$	
$\mathbf{x} = 32$	

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $\log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	$x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$
$x = (\sqrt{4})^5 = 2^5$	
$\mathbf{x} = 32$	

9.  $Log_3 x = 1.5$ 

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $Log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	$\mathbf{x} = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$
$x = (\sqrt{4})^5 = 2^5$	<b>x</b> =
$\mathbf{x} = 32$	

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

- 5.  $\log_2 x = 3$   $x = 2^3$  x = 86.  $\log_2 x = -3$   $x = 2^{-3} = 1/2^3$  x = 1/87.  $\log_4 x = 2.5$   $x = 4^{2.5} = 4^{(5/2)}$   $x = (\sqrt{4})^5 = 2^5$  x = 326.  $\log_2 x = -3$   $x = 2^{-3} = 1/2^3$  x = 1/88.  $\log_4 x = -1.5$   $x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$  $x = 1/(\sqrt{4})^3$
- 9.  $Log_3 x = 1.5$

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

- 5.  $\log_2 x = 3$   $x = 2^3$  x = 87.  $\log_4 x = 2.5$   $x = 4^{2.5} = 4^{(5/2)}$   $x = (\sqrt{4})^5 = 2^5$  x = 326.  $\log_2 x = -3$   $x = 2^{-3} = 1/2^3$  x = 1/88.  $\log_4 x = -1.5$   $x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$  $x = 1/(\sqrt{4})^3 =$
- 9.  $Log_3 x = 1.5$

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

- 5.  $\log_2 x = 3$   $x = 2^3$  x = 87.  $\log_4 x = 2.5$   $x = 4^{2.5} = 4^{(5/2)}$   $x = (\sqrt{4})^5 = 2^5$  x = 326.  $\log_2 x = -3$   $x = 2^{-3} = 1/2^3$  x = 1/88.  $\log_4 x = -1.5$   $x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$  $x = 1/(\sqrt{4})^3 = 1/2^3$
- 9.  $Log_3 x = 1.5$

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $Log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	$\mathbf{x} = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$
$x = (\sqrt{4})^5 = 2^5$	$x = 1/(\sqrt{4})^3 = 1/2^3$
$\mathbf{x} = 32$	<b>x</b> =

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $\log_4 x = 2.5$	8. $\log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	$x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$
$x = (\sqrt{4})^5 = 2^5$	$x = 1/(\sqrt{4})^3 = 1/2^3$
$\mathbf{x} = 32$	x = 1/8

9.  $Log_3 x = 1.5$ 

$$\log_{\mathbf{B}} \mathbf{x} = \mathbf{k} \qquad \mathbf{x} = \mathbf{B}^{\mathbf{k}}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5. $\log_2 x = 3$	6. $\log_2 x = -3$
$x = 2^{3}$	$x = 2^{-3} = 1/2^{3}$
$\mathbf{x} = 8$	x = 1/8
7. $Log_4 x = 2.5$	8. $Log_4 x = -1.5$
$\mathbf{x} = 4^{2.5} = 4^{(5/2)}$	$x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$
$x = (\sqrt{4})^5 = 2^5$	$x = 1/(\sqrt{4})^3 = 1/2^3$
$\mathbf{x} = 32$	x = 1/8

9.  $Log_3 x = 1.5$ 

$$\log_{B} x = k \qquad \qquad x = B^{k}$$

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5.  $Log_2 x = 3$ 6.  $Log_2 x = -3$  $x = 2^{-3} = 1/2^{3}$  $x = 2^{3}$ x = 1/8**x** = **8** 7.  $Log_4 x = 2.5$ 8.  $Log_4 x = -1.5$  $\mathbf{x} = 4^{2.5} = 4^{(5/2)}$  $x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$  $x = (\sqrt{4})^5 = 2^5$  $x = 1/(\sqrt{4})^3 = 1/2^3$ x = 32 x = 1/89.  $Log_3 x = 1.5$ 10. Log x = 0.8 $\log_{B} x = k$   $\longrightarrow$   $x = B^{k}$ 

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5.  $Log_2 x = 3$ 6.  $Log_2 x = -3$  $x = 2^{-3} = 1/2^{3}$  $x = 2^{3}$ x = 1/8**x** = **8** 7.  $Log_4 x = 2.5$ 8.  $Log_4 x = -1.5$  $\mathbf{x} = 4^{2.5} = 4^{(5/2)}$  $x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$  $x = (\sqrt{4})^5 = 2^5$  $x = 1/(\sqrt{4})^3 = 1/2^3$ x = 32 x = 1/89.  $Log_3 x = 1.5$ 10. Log x = 0.8 $\mathbf{x} =$  $\log_{B} x = k$   $\longrightarrow$   $x = B^{k}$ 

Solve for x. Express irrational solutions rounded to the nearest hundredth.

5.  $Log_2 x = 3$ 6.  $Log_2 x = -3$  $x = 2^{-3} = 1/2^{3}$  $x = 2^{3}$ x = 1/8**x** = **8** 7.  $Log_4 x = 2.5$ 8.  $Log_4 x = -1.5$  $\mathbf{x} = 4^{2.5} = 4^{(5/2)}$  $x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$  $x = (\sqrt{4})^5 = 2^5$  $x = 1/(\sqrt{4})^3 = 1/2^3$ x = 32 x = 1/89.  $Log_3 x = 1.5$ 10. Log x = 0.8 $x = 3^{1.5}$  $\log_{B} x = k$   $\longrightarrow$   $x = B^{k}$ 

Solve for x. Express irrational solutions rounded to the nearest hundredth.

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Solve for x. Express irrational solutions rounded to the nearest hundredth.

5.  $Log_2 x = 3$ 6.  $Log_2 x = -3$  $x = 2^{-3} = 1/2^{3}$  $x = 2^{3}$ **x** = **8** x = 1/87.  $Log_4 x = 2.5$ 8.  $Log_4 x = -1.5$  $\mathbf{x} = 4^{2.5} = 4^{(5/2)}$  $x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$  $x = (\sqrt{4})^5 = 2^5$  $x = 1/(\sqrt{4})^3 = 1/2^3$ x = 32 x = 1/89.  $Log_3 x = 1.5$ 10. Log x = 0.8 $x = 3^{1.5} \approx 5.20$  $\log_{B} x = k$   $\longrightarrow$   $x = B^{k}$ 

Solve for x. Express irrational solutions rounded to the nearest hundredth.

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Solve for x. Express irrational solutions rounded to the nearest hundredth.

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Solve for x. Express irrational solutions rounded to the nearest hundredth.

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Solve for x. Express irrational solutions rounded to the nearest hundredth.

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Solve for x. Express irrational solutions rounded to the nearest hundredth.

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Solve for x. Express irrational solutions rounded to the nearest hundredth.

5.  $\log_2 x = 3$   $x = 2^3$  x = 87.  $\log_4 x = 2.5$   $x = 4^{2.5} = 4^{(5/2)}$   $x = (\sqrt{4})^5 = 2^5$ x = 32

9. 
$$\log_3 x = 1.5$$
  
 $x = 3^{1.5} \approx 5.20$ 

6. 
$$\log_2 x = -3$$
  
 $x = 2^{-3} = 1/2^3$   
 $x = 1/8$ 

8. 
$$\log_4 x = -1.5$$
  
 $x = 4^{-1.5} = 4^{(-3/2)} = 1/4^{(3/2)}$   
 $x = 1/(\sqrt{4})^3 = 1/2^3$   
 $x = 1/8$ 

10. Log x = 0.8  
x = 
$$10^{0.8} \approx 6.31$$

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 =$$
 12.  $\log_5 3 =$ 

13.  $Log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 =$  12.  $\log_5 3 =$ 

13.  $Log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 =$  12.  $\log_5 3 =$ 

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 =$$
 12.  $\log_5 3 =$ 

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

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Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

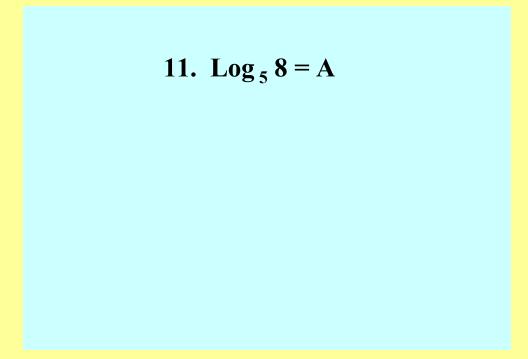
11. 
$$\log_5 8 =$$
 12.  $\log_5 3 =$ 

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

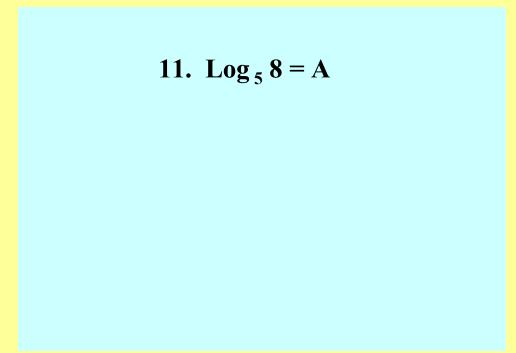
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Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



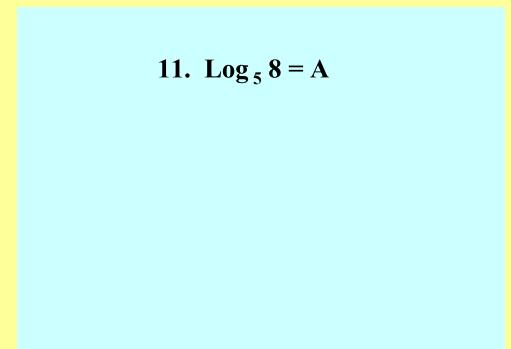
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Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



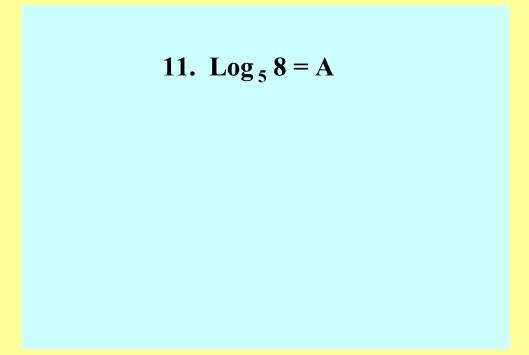
We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



We will begin by deriving the change of base formula. Using the definition of logs,

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



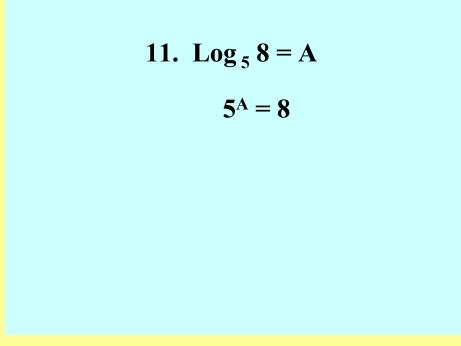
We will begin by deriving the change of base formula. Using the definition of logs, this implies that  $5^A = 8$ .

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$  $5^A = 8$ 

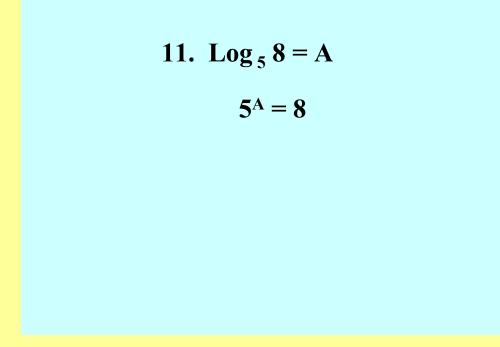
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Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$  $\log_B(5^A)$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$  $\log_B(5^A) =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$  $\log_B(5^A) = \log_B 8$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$  $\log_B(5^A) = \log_B 8$ 

We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$  $\log_B(5^A) = \log_B 8$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$   $\log_B(5^A) = \log_B 8$  $ALog_B 5$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_{5} 8 = A$   $5^{A} = 8$   $\log_{B}(5^{A}) = \log_{B} 8$  $ALog_{B} 5 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$   $\log_B(5^A) = \log_B 8$  $ALog_B 5 = Log_B 8$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$   $\log_B(5^A) = \log_B 8$  $A \log_B 5 = \log_B 8$ 

We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$   $\log_B(5^A) = \log_B 8$  $ALog_B 5 = Log_B 8$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_{5} 8 = A$   $5^{A} = 8$   $\log_{B}(5^{A}) = \log_{B} 8$   $ALog_{B} 5 = Log_{B} 8$ A =

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$   $\log_B(5^A) = \log_B 8$   $A \log_B 5 = \log_B 8$  $A = \frac{\log_B 8}{\log_B 8}$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$   $\log_B(5^A) = \log_B 8$   $A \log_B 5 = \log_B 8$  $A = \frac{\log_B 8}{\log_B 5}$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$   $\log_B(5^A) = \log_B 8$   $A \log_B 5 = \log_B 8$  $A = \frac{\log_B 8}{\log_B 5}$ 

We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = A$   $5^A = 8$   $\log_B(5^A) = \log_B 8$   $A \log_B 5 = \log_B 8$  $A = \frac{\log_B 8}{\log_B 5}$ 

We will begin by deriving the change of base formula. Now, we can substitute this expression for A in the original equation.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = A = \frac{\log_B 8}{\log_B 5}$$
  
 $5^A = 8$   
 $\log_B(5^A) = \log_B 8$   
 $A \log_B 5 = \log_B 8$   
 $A = \frac{\log_B 8}{\log_B 5}$ 

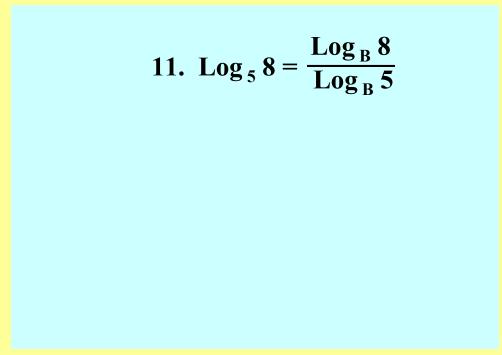
We will begin by deriving the change of base formula. Now, we can substitute this expression for A in the original equation.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log_B 8}{\log_B 5}$$
  
 $5^A = 8$   
 $\log_B(5^A) = \log_B 8$   
 $ALog_B 5 = \log_B 8$   
 $A = \frac{\log_B 8}{\log_B 5}$ 

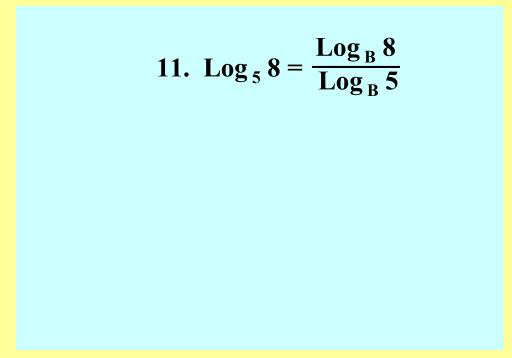
We will begin by deriving the change of base formula. Now, we can substitute this expression for A in the original equation.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



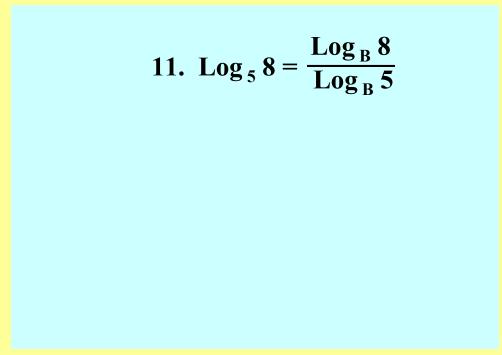
We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



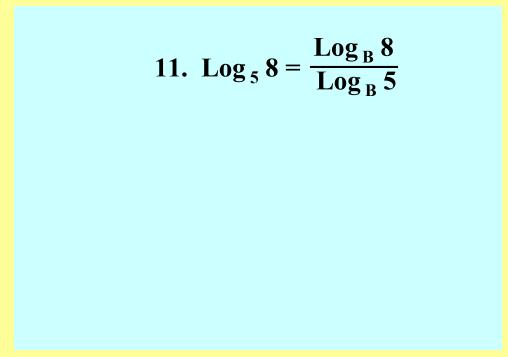
We will begin by deriving the change of base formula. We have 'changed the base' from base 5 to base B.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



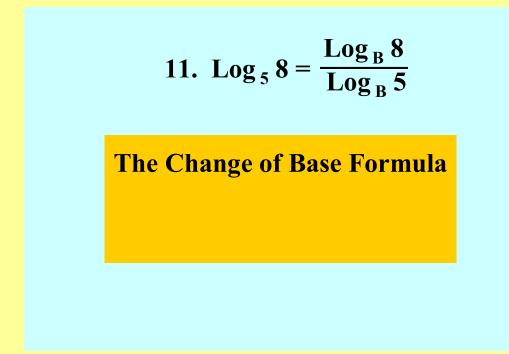
We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



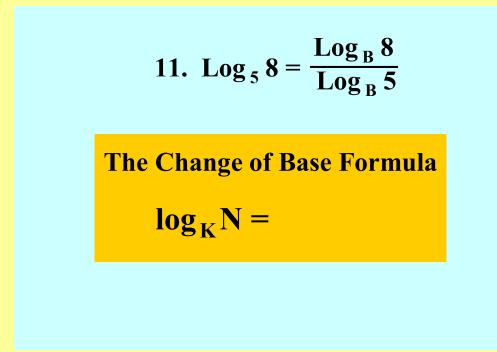
We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log_B 8}{\log_B 5}$$
  
The Change of Base Formula  
 $\log_K N = \frac{\log_B N}{\log_B N}$ 

We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log_B 8}{\log_B 5}$$
  
The Change of Base Formula  
 $\log_K N = \frac{\log_B N}{\log_B K}$ 

We will begin by deriving the change of base formula.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 =$  12.  $\log_5 3 =$ 

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.



13.  $\log_2 7 =$ 

14.  $\log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 =$ 

12.  $Log_5 3 =$ 

We will change the base to base 10, the common logarithm.

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11.  $\log_5 8 = \frac{\log 8}{\log 8}$ 

12.  $Log_5 3 =$ 

We will change the base to base 10, the common logarithm.

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5}$$

12. 
$$\log_5 3 =$$

We will change the base to base 10, the common logarithm.

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx$$

12. 
$$\log_5 3 =$$

We will change the base to base 10, the common logarithm.

13.  $Log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$

12. 
$$\log_5 3 =$$

We will change the base to base 10, the common logarithm.

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$
 12.  $\log_5 3 =$ 

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$

12. 
$$\log_5 3 =$$

We could have changed the base to base e, the natural logarithm.

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$
 12.  $\log_5 3 = \log_5 8 =$ 

We could have changed the base to base e, the natural logarithm.

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$
  
 $\log_5 8 = \frac{\ln 8}{\log 5}$ 

12.  $Log_5 3 =$ 

We could have changed the base to base e, the natural logarithm.

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$
  
 $\log_5 8 = \frac{\ln 8}{\ln 5}$ 

We could have changed the base to base e, the natural logarithm.

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

12.  $Log_5 3 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$
  
 $\log_5 8 = \frac{\ln 8}{\ln 5} \approx$ 

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We could have changed the base to base e, the natural logarithm.

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$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$
  
 $\log_5 8 = \frac{\ln 8}{\ln 5} \approx 1.29$ 

We could have changed the base to base e, the natural logarithm.

13.  $\log_2 7 =$ 

14.  $\log_8 200 =$ 

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Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$
  
 $\log_5 8 = \frac{\ln 8}{\ln 5} \approx 1.29$   
12.  $\log_5 3 = \frac{\log_5 8}{\log_5 5} \approx 1.29$ 

13.  $\log_2 7 =$ 

14.  $Log_8 200 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

11. 
$$\log_5 8 = \frac{\log 8}{\log 5} \approx 1.29$$
  
 $\log_5 8 = \frac{\ln 8}{\ln 5} \approx 1.29$ 

The results are exactly equal to each other, as expected.

13.  $Log_2 7 =$ 

14.  $Log_8 200 =$ 

12.  $Log_5 3 =$ 

Use the change of base formula to evaluate each of the following logarithms. Express your answers rounded to the nearest hundredth.

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Write the compound interest formula. Substitute the given values of A, P, R, and N.

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Solve for T. Reorder the equation, and 'take the Log of each side'.

$A = P(1 + R/N)^{NT}$ A = 600 P = 500 R = 0.03	$600 = 500(1 + 0.03/12)^{12T}$ $1.2 = 1.0025^{12T}$ $Log(1.0025^{12T})$
N = 12	
<b>Reorder the equ</b>	Solve for T. uation, and 'take the Log of each side'.

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Solve for T. Answer the question.

15. \$500 is invested in an account that pays interest at an annual rate of 3% compounded monthly. How long will it take for the value of the account to reach \$600?

$\mathbf{A} = \mathbf{P}(1 + \mathbf{R}/\mathbf{N})^{\mathbf{N}\mathbf{T}}$	$\implies 600 = 500(1 + 0.03/12)^{12T}$	
$\mathbf{A} = 600$	$1.2 = 1.0025^{12T}$	
$\mathbf{P}=500$	$Log(1.0025^{12T}) = Log 1.2$	
R = 0.03	12T  Log  1.0025 =  Log  1.2	
N = 12	$T = \frac{Log \ 1.2}{12Log \ 1.0025} \approx 6.1$	
	It will take about 6.1 years.	
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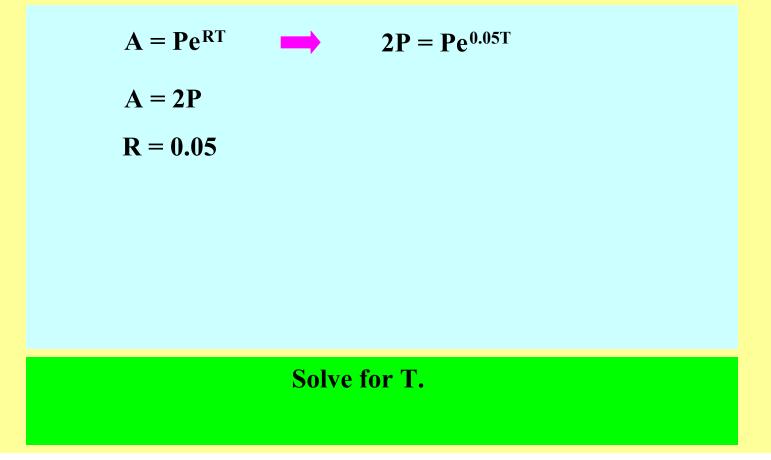
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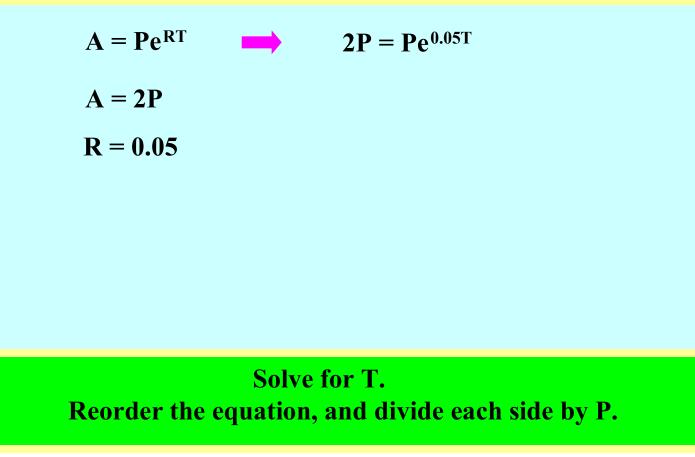
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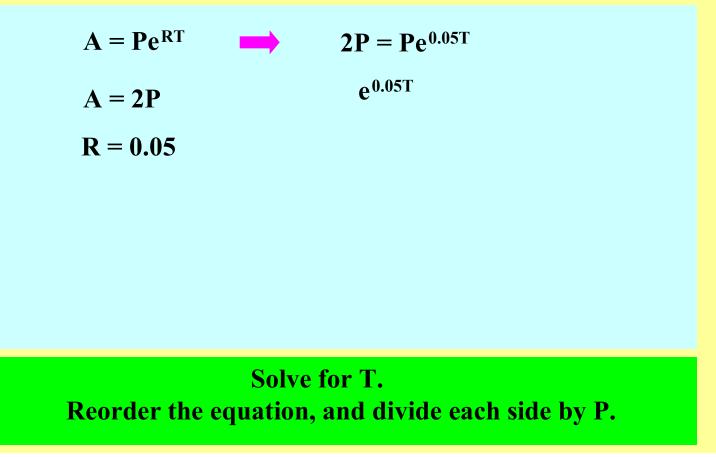
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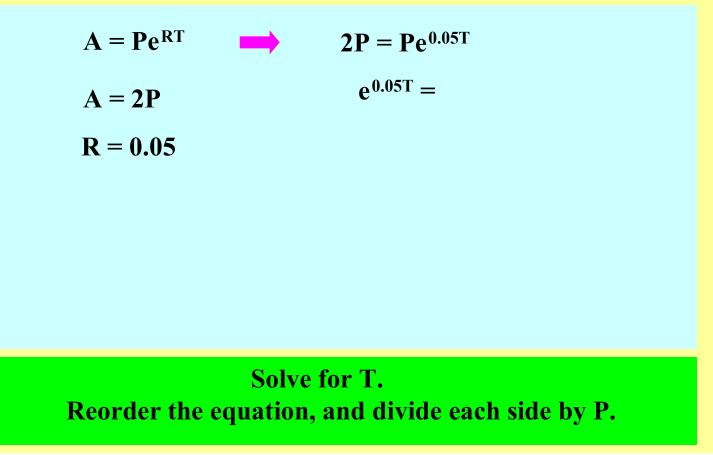
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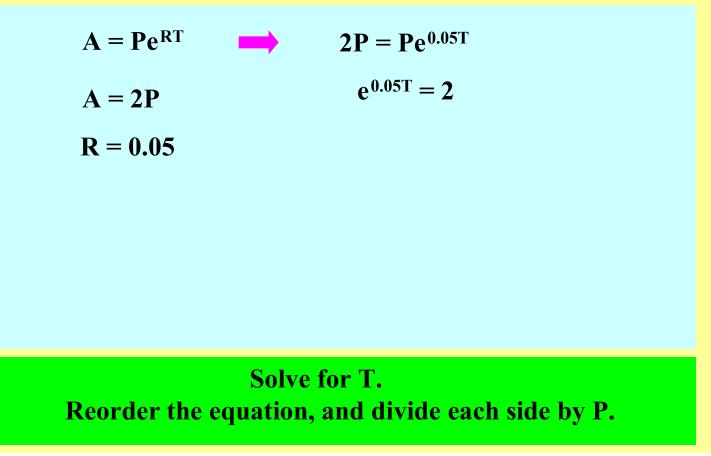
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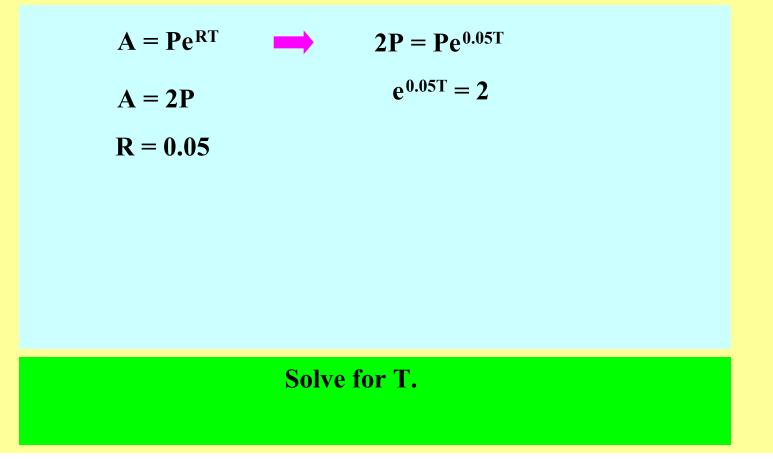


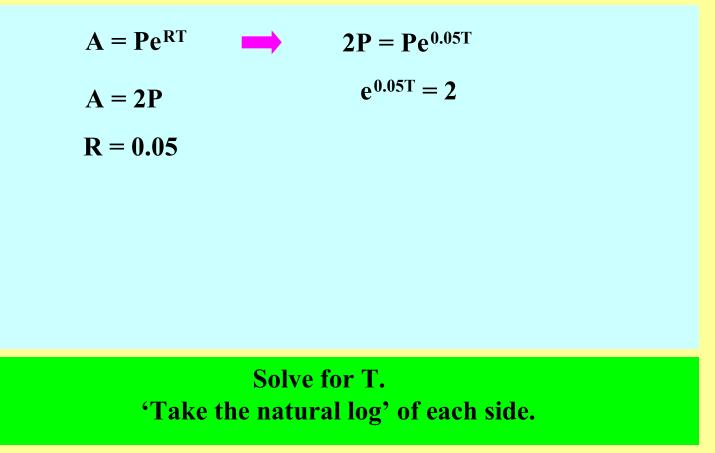


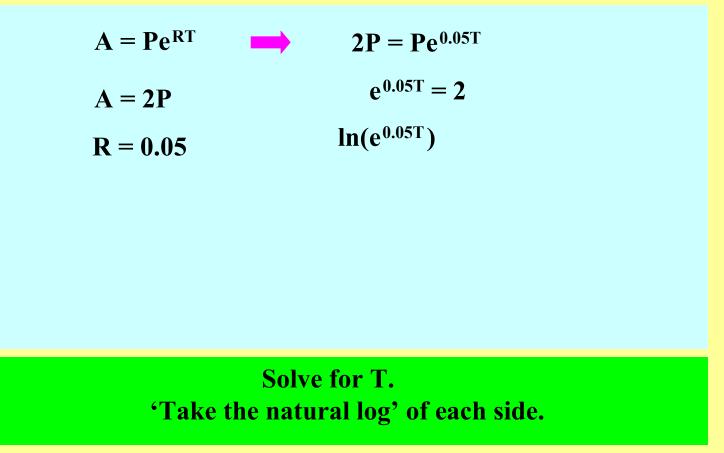


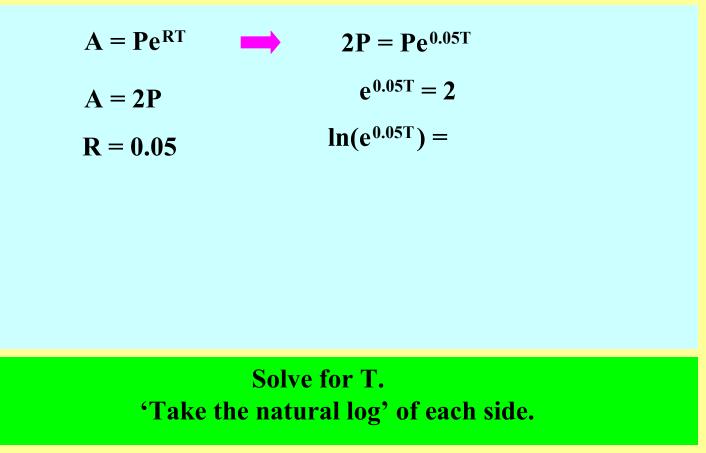


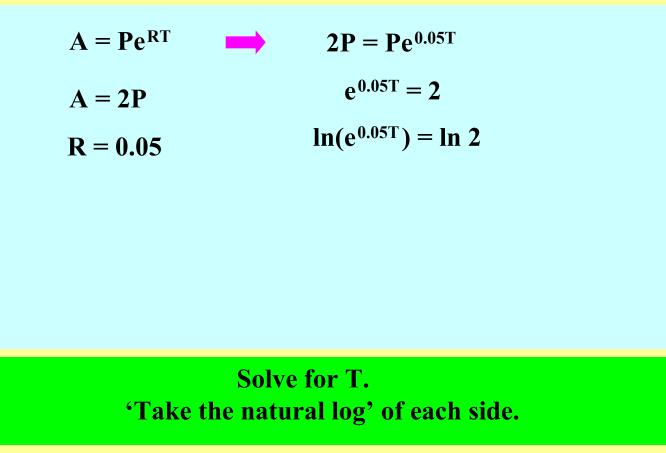


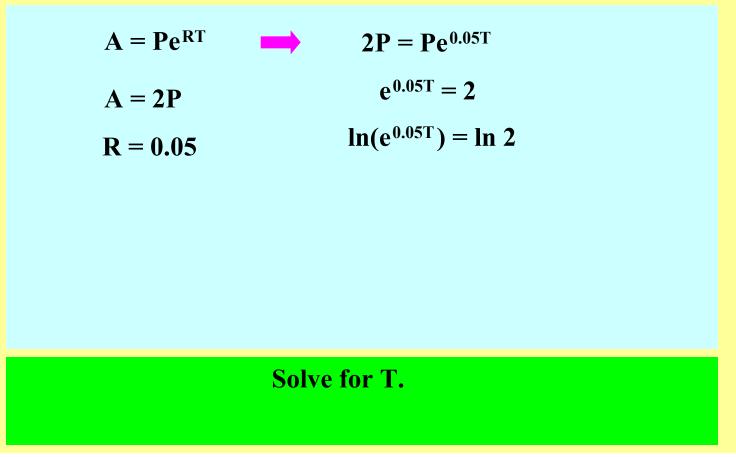


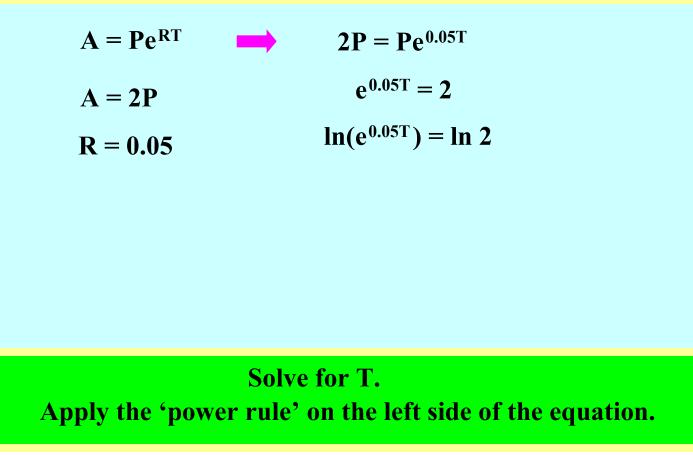


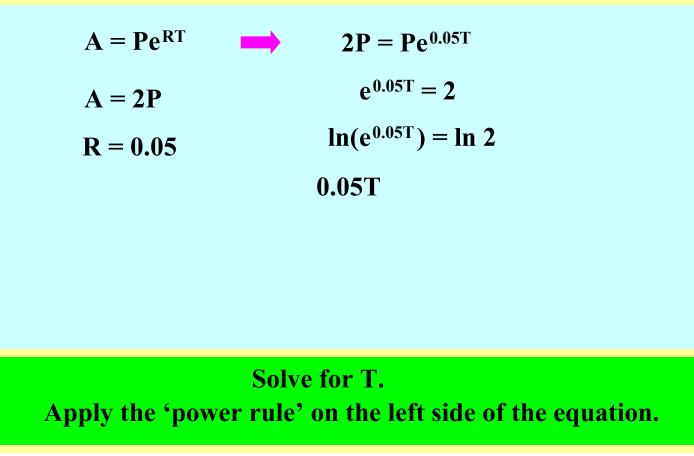












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	0.05T ln e
Apply the 'pow	Solve for T. er rule' on the left side of the equation.

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Div

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