**Functions Date:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Leading Question:** How do we use logarithms to solve equations?

**Logarithmic and Exponential Equations**

We saw in a previous lesson that for certain exponential equations there is a need to make use of logs in order to solve. We will investigate this a bit further:

**Examples**

Solve each of the following **exponential** equations:

a) $2^{2x+3}=32$ b) $4^{2x}=8^{x+2}$

c) $3^{x}=15$ d) $5^{3x-2}=23$

e) $2^{2x}-9=0$ f) $3^{2x}-3^{x}=0$

g) $2^{2x}-6∙2^{x}+5=0$

**Examples**

Solve each of the following **logarithmic** equations:

a) $log\_{2}x=5$ b) $log\_{3}81=x$

c) $log\_{x}16=4$ d) $log\_{2}x+log\_{2}3=7$

e) $log\_{3}x-log\_{3}(x-1)=5$ f) $log\_{5}x+log\_{5}\left(x-1\right)=log\_{5}12$

g) $\left(log\_{2}x\right)^{2}+log\_{2}x-2=0$ h) $log\_{3}\left(3^{x+1}-9\right)=x$

**Independent Practice**

**1**





**2**

**3**

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**4**

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**Answers**

**1**



**2**





**3**

**4**

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