

Logarithm Basics

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- ▶ $\log_3\left(\frac{1}{3}\right) = -1$ means the same as $3^{-1} = \frac{1}{3}$

Finding exact values of logarithms

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- ▶ What is $\log_2(32)$?
- ▶ Write 32 as a power of the base 2:
 $32 = 2^5$
- ▶ So $\log_2(32) = 5$
(The exponent that you put on the base 2 in order to get 32)

Finding exact values of logarithms part 2

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- ▶ What is $\log_5(125\sqrt{5})$?
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- ▶ Write 125 and the square root as a power of the base 5:
 $125\sqrt{5} = 5^3 \cdot 5^{1/2}$
- ▶ Now use the “product of powers of the same base” rule:
 $5^3 \cdot 5^{1/2} = 5^{3+\frac{1}{2}} = 5^{\frac{7}{2}}$

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- ▶ Now use the “product of powers of the same base” rule:
 $5^3 \cdot 5^{1/2} = 5^{3+\frac{1}{2}} = 5^{\frac{7}{2}}$
- ▶ so $\log_5(125\sqrt{5}) = \frac{7}{2}$
(The exponent that you put on the base 5 in order to get $125\sqrt{5}$)