SOLVING LOGARITHMIC AND EXPONENTIAL EQUATIONS

More 7.3 Notes

Solve:

Ex. 1 $v=\log_8 64$

$8^v=64$

$8^v=8^2$

$v=2$

Ex. 2 $5=\log_v 32$

$v^5=32$

$(v^5)^{1/5}=(32)^{1/5}$

$v=\sqrt[5]{32}$

$v=2$

Ex. 3 $4=\log_3 v$

$3^4=v$

$81=v$

$v=81$

Ex. 4 $10^x=85$

$\log_{10}85=x$ (calculator does BASE 10 common log)

$x\approx 1.929$

Ex. 5 $v=\log_3 27$

$3^v=27$

$3^v=3^3$

$v=3$

Ex. 6 $\log_{125}5=v$

$125^v=5$

$(5^3)^v=5$

$5^{3v}=5^1$

$3v=1$

$v=1/3$

Ex. 7 $\log_v \frac{1}{25}=-2$

only positive

$v^{-2}=\frac{1}{25}$

$\frac{1}{v^2}=\frac{1}{25}$

$v^2=25$

$v=\pm 5$

But -5 not possible so $v=5$

Ex. 8 $\log_6 v=-2$

$6^{-2}=v$

$\frac{1}{6^2}=v$

$\frac{1}{36}=v$

$v=\frac{1}{36}$

Ex. 9 $\log_v 7=\frac{1}{2}$

$v^{\frac{1}{2}}=7$

$(v^{\frac{1}{2}})^2=(7)^2$

$v=49$