## Exponential Equations

Strategy - Using the theorem; $b^{x}=b^{y}$ iff $x=y$

Make the bases the same, then set the exponents equal and solve the resulting equations.

Example: $\quad 9^{\mathrm{x}}=81^{\mathrm{x}-1}$
$\left(3^{2}\right)^{x}=\left(3^{4}\right)^{x-1}$
$3^{2 x}=3^{4 x-4}$

$$
\therefore 2 x=4 x-4, \text { so } x=2
$$

Solve each equation.
A
B

1. $2^{x}=4$
$3^{x}=27$
2. $4^{x}=64$
$2^{x}=32$
3. $7^{x}=1$
$5^{x}=0$
4. $4\left(2^{x}\right)=32$
$2\left(3^{x}\right)=162$
5. $2\left(5^{x}\right)+2=52$
$5^{x}-3=22$
6. $4\left(2^{x}\right)-6=58$
$2^{x}=1 / 2$
7. $4^{x}=1 / 16$

$$
3^{x}=1 / 81
$$

