Solve each exponential equation. Give the exact value for x.

(a) 9^x= 1/81

$9^x = \frac{1}{81}$; => $81 = 9^2$;

$9^x = \frac{1}{9^2}$;

$9^x = 9^{-2}$; => $\boxed{a^{f(x)} = b^{g(x)}, and \; a > 0, \; a \neq 1 \; then \; f(x) = g(x)}$

9=9 => x=-2.

(b) 3^x=6

$3^x = 6$; => $\boxed{a^x = b => x = \log_a b}$

$3^x = 6$; => x=$\log_3 6$ => $\log_3 6 = \frac{\log 6}{\log 3} = 1.6309$.

(c) 4^x=2.5

$4^x = 2.5 = \frac{5}{2}$;

Eliminate the exponential from the left hand side.

Take the logarithm base 4 of both sides:

Answer: x=$\frac{\log \frac{5}{2}}{\log 4}$ = 0.6609.

(d) 2^x =3

$2^x = 3$;

Eliminate the exponential from the left hand side.

Take the logarithm base 2 of both sides:

Answer: x=$\frac{\log 3}{\log 2}$ =1.584.