

## 8.5 Exponential and Logarithmic Equations

Solve each equation. If necessary, write answers using log base 10.

1)  $4^{3x} = 4^{2x}$

2)  $5^{2x} = \frac{1}{625}$

3)  $25^{3-2a} = 625$

4)  $6^{-3p} = 36$

5)  $6^{2x+1} = 36$

6)  $27^{2-2x} = 81^{2-2x}$

7)  $10^{-7b} + 5 = 7$

8)  $6^{-7n} + 1 = 49$

9)  $8 \cdot 18^{6x} = 39$

10)  $10 \cdot 10^{4x} = 66$

11)  $10^{b-7} + 5 = 10$

12)  $16^{r+1} + 10 = 43$

$$13) 3.9e^{m-7} = 10$$

$$14) 9e^{8y} = 77$$

$$15) -2e^{p+4} = -35$$

$$16) 5e^{r-2} = 96$$

$$17) \log_4(x-10) + \log_4 9 = \log_4 24$$

$$18) \log_8(x-5) + \log_8 7 = 2$$

$$19) \log_8(x^2+7) + \log_8 4 = 2$$

$$20) \log_5(x^2-10) - \log_5 3 = \log_5 2$$

$$21) \ln 6 - \ln(x-3) = \ln 39$$

$$22) \ln 3x^2 - \ln 3 = 4$$

23) The equation  $y = 6.72 \cdot 1.014^x$  models the world's population,  $y$ , in billions of people,  $x$  years after the year 2000. Find the year in which the world population is about 8 billion.