

This worksheet is homework to be included in your homework notebook.

Solve the following equations for x .

1. $3 \ln x = 8$

2. $\ln 2x + 4 = 0$

3. $e^{\sqrt{x}} = 4$

4. $\ln(2x + 4) = 0$

5. $\ln 4 - \ln x = \frac{2}{3}$

6. $2 \ln x^2 = 8$

7. $236e^{-0.2x} = 510$

8. $e^{2x+4} = 3$

9. $e^x \cdot e^4 = 2$

10. $(e^x)^3 = 8$

11. $\ln x + 2 \ln x = 6$

12. $2^{3x} = 7$

13. $\ln(2x + 1) + \ln x = 0$

14. $\frac{e^{3x}}{e^x} = 4$

15. In 1990, the world population was 5.3 billion and the estimated rate at which it grows is 1.6% per year. The equation modeling the world population is

$$P = 5.3e^{0.016t}$$

where t is the number of years after 1990 and P is in billions.

(a). What is the predicted population in 2005? (Compare with the current estimate of 6.45 billion)

(b). When will the population reach 10 billion?

Answers to Odd Problems:

1. $e^{8/3}$ 2. $\frac{e^{-4}}{2}$ 3. $(\ln 4)^2$ 4. $-\frac{3}{2}$ 5. $\frac{4}{e^{2/3}}$ 6. e^2 7. $\frac{\ln\left(\frac{510}{236}\right)}{-0.2} \approx -3.85$

8. $\frac{\ln(3) - 4}{2}$ 9. $-4 + \ln 2$ 10. $\frac{\ln 8}{3}$ 11. e^2 12. $\frac{1 \ln 2}{3 \ln 7}$ 13. $\frac{1}{2}$ 14. $\frac{1}{2} \ln 4$

15. (a). 6.74 billion (b). About the year 2030

Homework Section 5.3, p. 349: #1-21(odd)