

Extra Practice for Chapter 8.4

1. Solving the following equations. Show restrictions and final answer in a box.

a) $\log_2(x - 2) + \log_2(x - 1) = 2$

b) $\log_3(2x + 5) - \log_3(x + 2) = \log_3 4$

2. Solving the following equations:

a) $3^{(x-1)} = 9(27)^{(2-x)}$

b) $2^{(x-3)} = 3(5)^{(2-x)}$

Extra Practice for Chapter 8.4

Applications

3. A scientist started with a culture of 20 bacteria in a dish. He noticed that after 80 hours, there were 1800 bacteria. What is the doubling time of this bacteria?

4. At the beginning of the year, you deposit \$1000 into a bank account, with an annual interest rate of 5%. Assume no other deposits or withdrawals are made and the interest rate stays constant.

a) what will be the value of the account after 5 years if interest is compounded annually?

b) how long will it be when his money doubles in value?

Extra Practice for Chapter 8.4

5. When people take a particular medicine, the drug is metabolised and eliminated at a certain rate. Suppose the initial amount of a drug in the body is 200 mg and is eliminated at a rate of 30% per hour. How long will it take to reach 10 mg?

6. Certain bacteria, given favourable growth conditions, grow continuously at a rate of 4.6% a day. Find the bacterial population after thirty-six hours, if the initial population was 250 bacteria.

Extra Practice for Chapter 8.4

7. A penicillin solution has a half-life of 6 days. How long will it take for the concentration to drop to 70% of the initial concentration?

8. What is the magnitude of the earthquake in City A if the earthquake in City B has a magnitude of 5.7 on the Richter scale and is 4500 times as intense?

Extra Practice for Chapter 8.4

9. What is the pH of a tomato if it is 15000 times more acidic than hand soap with a pH of 9.5?

10. It is said that the eardrum can rupture at a decibel level that is 100,000,000 times as intense as the normal sound level of a vacuum at 70Db on the Decibel scale (that would be like listening to a jet at take-off). At what Db value on the scale can the eardrum rupture?