

## MAT 171 - CLASS NOTES - Section 4.4: Exponential and Logarithmic Equations

1) Solve for  $x$ .

a)  $3^x = 81$

b)  $2^{x-4} = 32$

c)  $\left(\frac{1}{5}\right)^{x-1} = 625$

d)  $e^{x+4} = \frac{1}{e^{2x}}$

2) Solve the exponential equation algebraically. Approximate the result to three decimal places.

a)  $4^x = 26$

b)  $2(5^x) = 32$

c)  $4e^x = 91$

d)  $4^{-3t} = 0.10$

e)  $8^{2-x} = 431$

3) Solve the logarithmic equation algebraically. Approximate the result to three decimal places.

a)  $\log_6 x = 3$

b)  $\ln x = 2$

c)  $2\ln(3x) = 7$

d)  $\log(x + 6) = \log(2x - 1)$

e)  $\log_3(x + 2) + \log_3(x - 4) = 3$

f)  $\ln(2x + 3) - \ln(x - 2) = \ln(x + 6)$

g)  $3\log x = \log 64$

- 4) In a savings account where interest is compounded continuously, the initial investment is \$750 and the annual interest rate is 10.5%. Find the time it takes to double the amount of money in the account.

- 5) If \$8,000 dollars is invested for 12 years compounded continuously, then what interest rate would be required to end up with \$18,000? (Round to the nearest tenth of a percent.)

- 6) The number  $y$  of daily fee golf facilities in the United States from 1995 to 2003 can be modeled by  $y = 4381 + 1883.6 \ln t$ ,  $5 \leq t \leq 13$ , where  $t$  represents the year, with  $t = 5$  corresponding to 1995. During which year did the number of daily fee golf facilities reach 9000?