Solve the following equations algebraically

1.
$$7e^{3x} = 42$$

2.
$$5^{2x} = 15$$

$$3. \quad \log x^2 = 4$$

4.
$$ln(x-3) = 2$$

$$_{5.} 2^{x} - 6 = 10$$

6.
$$\log_4(x-5) = -1$$

7. If the price of a gallon of gas is currently \$3.25, how long will it take for the price to rise to \$4.00 if the rate of inflation is 10.5%?

$$4 = 3.25(1 + .105)^t$$