

C3 Exponentials And Logarithms

- Sketch the following exponential graphs.
 - $y = e^{-x}$.
 - $y = -e^{-x}$.
 - $y = 2e^x - 3$.
 - $y = 4 - e^{1-x}$.
- Sketch the following logarithmic graphs.
 - $y = \ln x$.
 - $y = \ln(-x)$.
 - $y = \ln(2x + 1)$.
 - $y = 3 + \ln(1 - x)$.
- Solve the following equations.
 - $e^{2x} = 3$.
 - $2e^x - 2 = 5$.
 - $1 = \ln(2x + 1)$.
 - $\ln x + \ln(x + 1) = 2$.
 - $\ln(x + 2) = \ln(x - 2) + 1$.
 - $e^{2x} + 2 = 3e^x$.
 - $3e^{2x} + 7e^x = 6$.
 - $e^{2x} + e^x = 1$.
- The mass in grams of a fungus after t hours is given by $M = 10e^{t/10}$.
 - What is the initial mass of the fungus?
 - Find the mass of the fungus after a day.
 - After how many hours is the mass of the fungus 300 grams.
- The population of the earth is increasing exponentially. The population was 6 billion in 1999 AD. The population was 7 billion in 2011 AD.
 - What was the population in year 0 AD?
 - What will the population be in 2100 AD?
 - When will the population be 1 trillion?
- The pressure in the Enterprise warp core is increasing exponentially. After 4 hours it is 2000 Pascals. After 7 hours it is 300000 Pascals.
 - Find the pressure initially.
 - Find the pressure after 9 hours.
 - After how many hours is the pressure 2×10^9 Pascals.