10th lesson - Exponential function and logarithm

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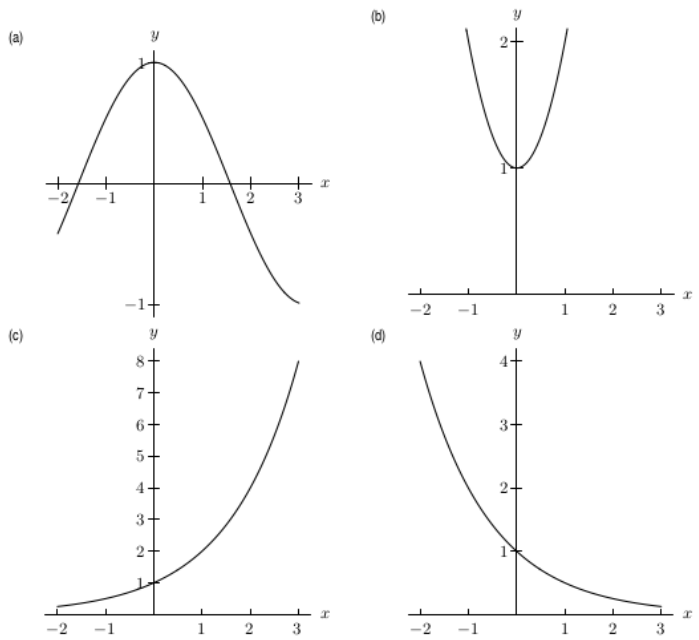
Todays source:

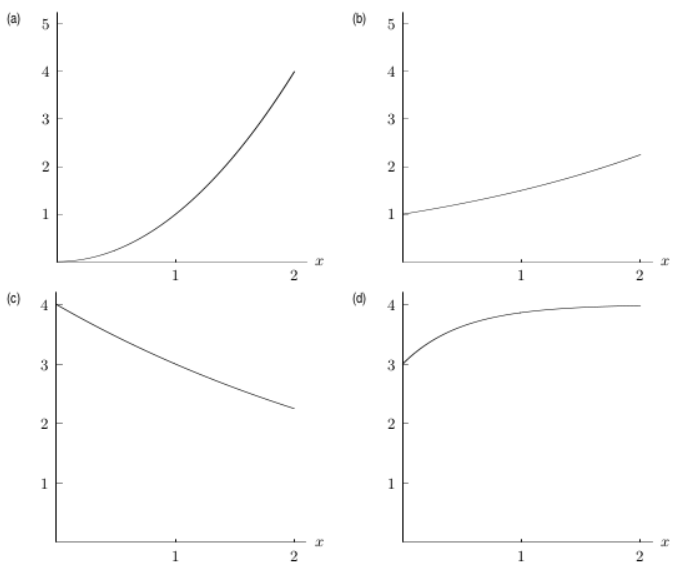
http://nebula2.deanza.edu/~karl/Classes/Files/Math12/ch01.pdf

Exercises

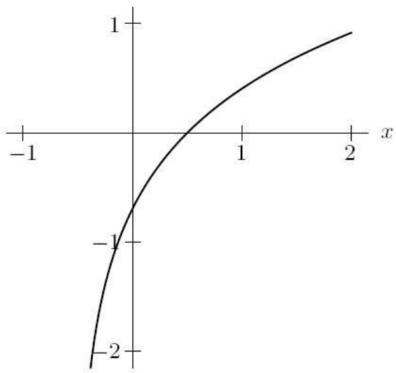
1. Find the graph of 2^x



2. Find the graph of ab^x, $b > 1$:



3. Find the function for the graph:



(A) $\ln x + \frac{1}{2}$
(B) $\ln x - \frac{1}{2}$
(C) $\ln(x + \frac{1}{2})$
(D) $\ln(x - \frac{1}{2})$

4. Find t, if $100 = 50e^t$:

(A) $t = \ln 2$ (B) $t = \frac{\ln 100}{\ln 50}$ (C) $t = \frac{\ln 100}{50}$ (D) $t = 100e^{50}$

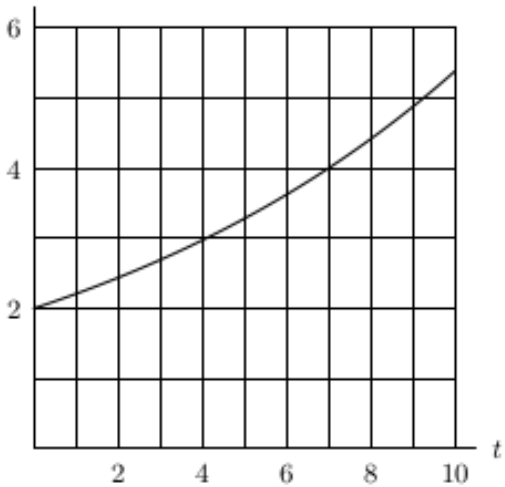
5. Solve for x: $8y = 3e^x$

(A) $\ln 8 + \ln 3 + \ln y$
(B) $\ln 3 - \ln 8 + \ln y$
(C) $\ln 8 + \ln y - \ln 3$
(D) $\ln 3 - \ln 8 - \ln y$

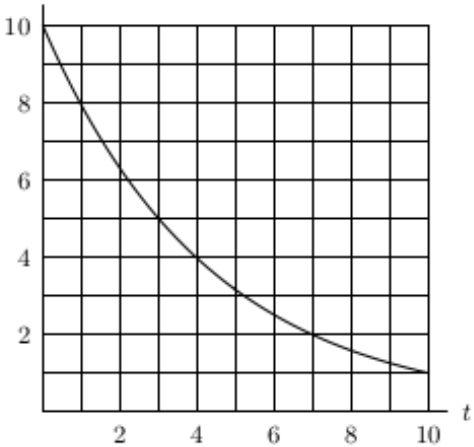
6. Find function(s) which is increasing and convex:

(A) 3^{-x} (B) 2^x (C) $\ln x$ (D) $-\ln x$

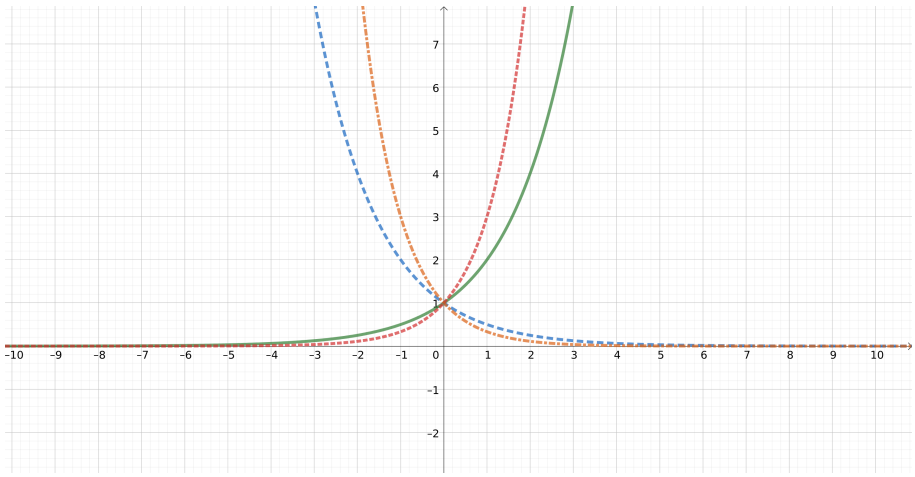
7. Find the doubling time for the exponential growth:



8. Find the half-life for the exponential decay:



9. Find functions: $y = 3^x$, $y = 2^x$, $y = 2^{-x}$, $y = \left(\frac{1}{3}\right)^x$:



10. In 1988, the inflation rate in Nicaragua was average 1.3% a day. Which formula represents the rate of inflation? (t is in days and I_0 represents the initial inflation.)

(A) $I(t) = I_0 e^{0.013t}$
(B) $I(t) = I_0 e^{1.3t}$
(C) $I(t) = I_0(1.013)^t$
(D) $I(t) = I_0(1.013)t$
(E) $I(t) = I_0(1.3)^t$

11. A student drinks a cup of coffee with 100 mg of caffeine. The half-life of caffeine is 4 hours. We want to know, when the amount of caffeine in the body is down to 10mg. Which formulae helps us? (And how?)

(A) $10 = 100e^{4k}$
(B) $100 = 10e^{4k}$
(C) $50 = 100e^{4k}$
(D) $10 = 100/4e^k$
(E) $P = 100/10e^4$

12. At midnight, a patient received 25 mg of a drug. The amount of the drug in the body decreases by 12% each hour. How we can describe the amount of the drug in the body? (As a function of time t.)

(A) $A(t) = 25 - 12t$
(B) $A(t) = 25 - 0.12t$
(C) $A(t) = 25(0.12)^t$
(D) $A(t) = 25(0.88)^t$
(E) $A(t) = 25(1.88)^t$
(F) $A(t) = 25(-0.12)^t$
(G) $A(t) = 12(0.25)^t$

13. Find functions: $y = \ln x$, $y = |\ln x|$, $y = \ln(|x|)$, $y = \ln(-x)$, $y = -\ln x$.