

11th lesson

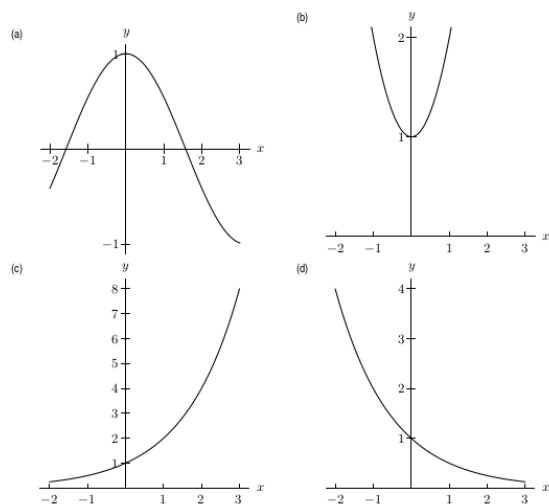
<https://www2.karlin.mff.cuni.cz/~kuncova/en/teachIM.php>
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Today's source:

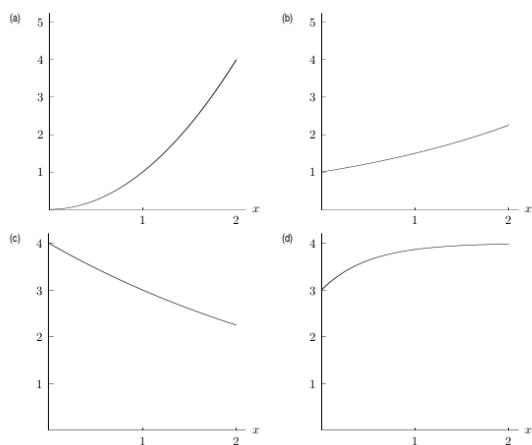
<http://nebula2.deanza.edu/~karl/Classes/Files/Math12/ch01.pdf>

Exercises

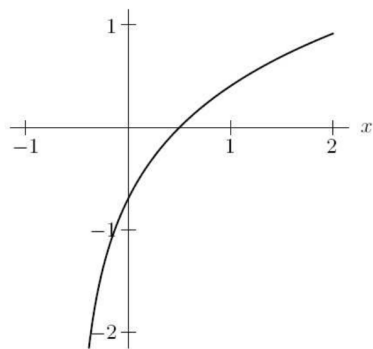
1. Find the graph of 2^x



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



3. Find the function for the graph:



- (A) $\ln x + \frac{1}{2}$ (C) $\ln(x + \frac{1}{2})$
(B) $\ln x - \frac{1}{2}$ (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) $t = 100e^{50}$

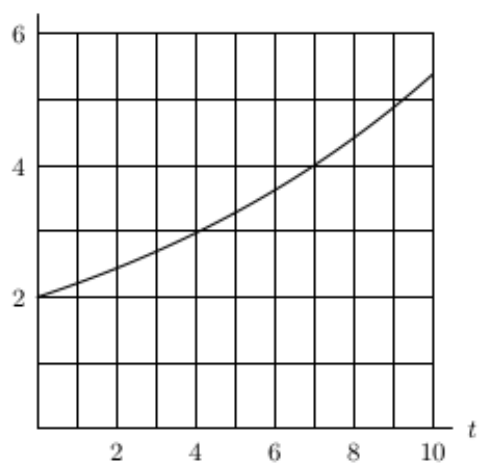
5. Solve for x : $8y = 3e^x$

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

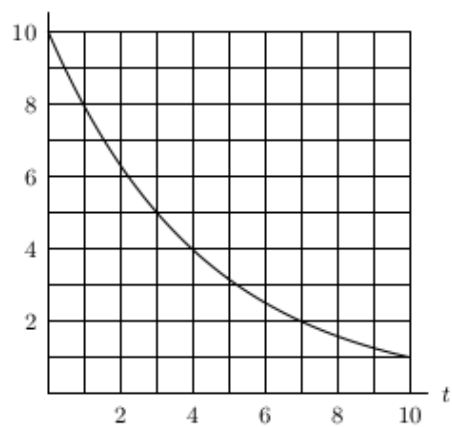
6. Find function(s) which is increasing and convex:

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

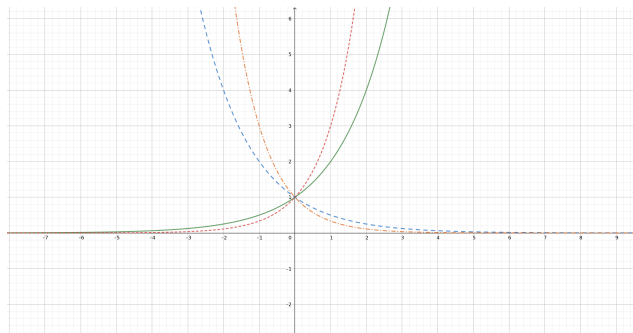
7. Find the doubling time for exponential growth:



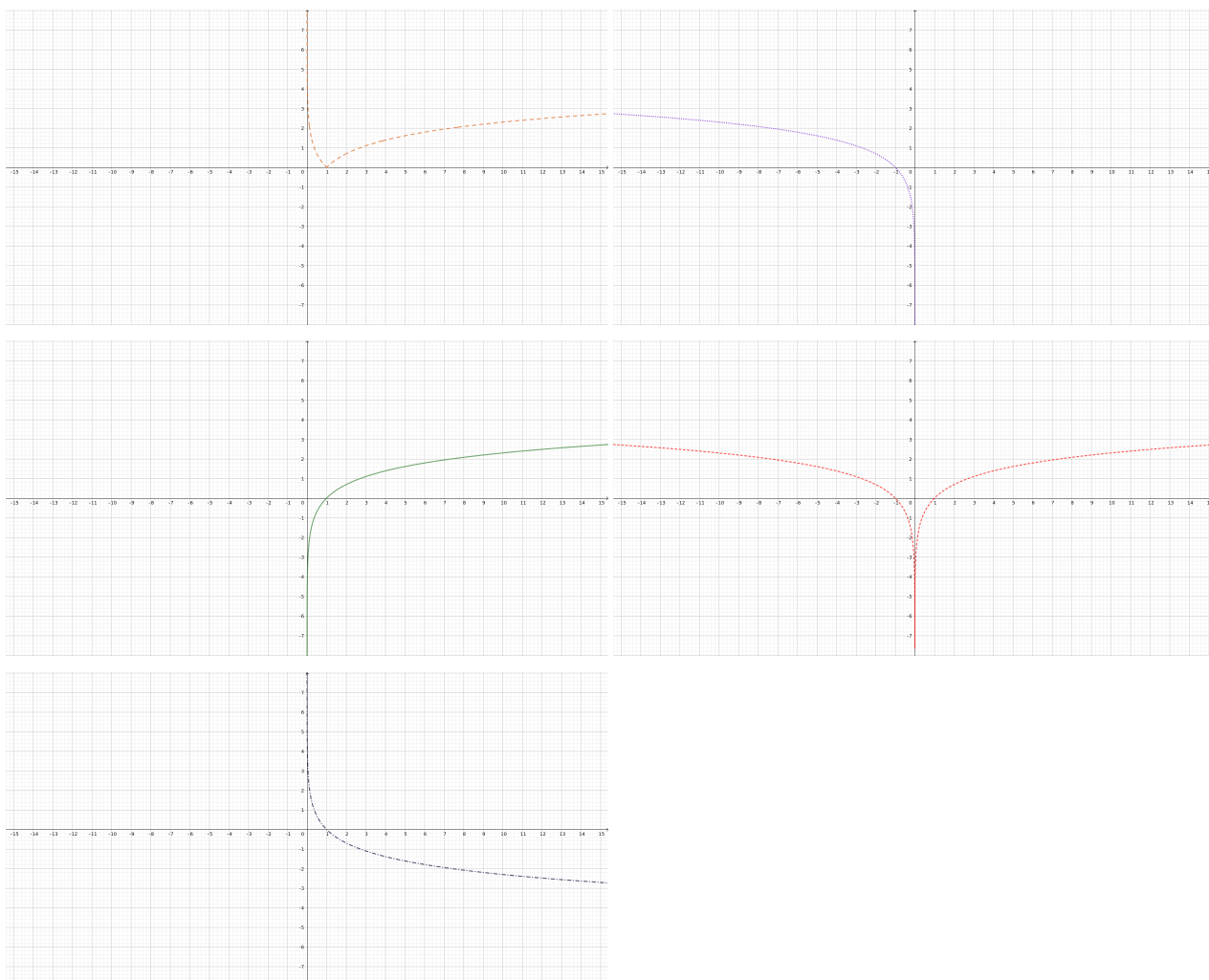
8. Find the half-life for the exponential decay:



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



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



11. 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) $I(t) = I_0 (1.3)^t$

12. 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) $P = 100/10e^4$

13. 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) $A(t) = 12(0.25)^t$