## 10th lesson

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

## Exercises

1. Find the graph of $2^{x} \mathrm{C}$


2. Find the graph of $a b^{x}, b>1:$ B

3. Find the function for the graph:

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

C
4. Find $t$, if $100=50 e^{t}$ :
(A) $t=\ln 2$
(B) $t=\frac{\ln 100}{\ln 50}$
(C) $t=\frac{\ln 100}{50}$
(D) $t=100 e^{50}$

A
5. Solve for $x: 8 y=3 e^{x}$
(A) $\ln 8+\ln 3+\ln y$
(B) $\ln 3-\ln 8+\ln y$
(C) $\ln 8+\ln y-\ln 3$
(D) $\ln 3-\ln 8-\ln y$

C
6. Find function(s) which is increasing and convex:
(A) $3^{-x}$
(B) $2^{x}$
(C) $\ln x$
(D) $-\ln x$

B
7. Find the doubling time for exponential growth:

7
8. Find the half-life for the exponential decay:

9. Find functions: $y=3^{x}, y=2^{x}, y=2^{-x}, y=\left(\frac{1}{3}\right)^{x}$ :
https://www.geogebra.org/calculator/bwmedxtw

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) $I(t)=I_{0} e^{0.013 t}$
(B) $I(t)=I_{0} e^{1.3 t}$
(C) $I(t)=I_{0}(1.013)^{t}$
(D) $I(t)=I_{0}(1.013) t$
(E) $I(t)=I_{0}(1.3)^{t}$

C
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 10 mg . Which formulae helps us? (And how?)
(A) $10=100 e^{4 k}$
(B) $100=10 e^{4 k}$
(C) $50=100 e^{4 k}$
(D) $10=100 / 4 e^{k}$
(E) $P=100 / 10 e^{4}$

## C

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) $A(t)=25-12 t$
(B) $A(t)=25-0.12 t$
(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) $A(t)=12(0.25)^{t}$

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

https://www.geogebra.org/calculator/npwvjpsx

