Log & Exponential Equations

1.) Solver
2.) Intersection method.
3.) by Hand

Ex $$3^{x+1} = 12^{2x-3}$$

2) $Y_1 = 3 \wedge (x+1)$
$Y_2 = 12 \wedge (2x-3)$
calc 5: Intersect
<enter> 3
$x = 2.2$

1) Solver
$0 = 3 \wedge (x+1) - 12 \wedge (2x-3)$

3) $3^{x+1} = 12^{2x-3}$
(P5) "log of both sides"
$\log 3^{x+1} = \log 12^{2x-3}$
(P3) "ladder"
$(x+1)\log 3 = (2x-3)\log 12$
(Algebra)

$$x\log 3 + \log 3 = 2x\log 12 - 3\log 12$$

$$x\log 3 - 2x\log 12 = -\log 3 - 3\log 12$$

$$x(\log 3 - 2\log 12) = -\log 3 - 3\log 12$$

$$x = \frac{-\log 3 - 3\log 12}{\log 3 - 2\log 12} = 2.2$$

(P3)

$$= \frac{\log 3^{-1} + \log 12^{-3}}{\log 3 + \log 12^{-2}}$$

(P2)

$$= \frac{\log(3^{-1} \cdot 12^{-3})}{\log(3 \cdot 12^{-12})}$$

(P4)

$$= \log_{3/12^{12}}(3^{-1} \cdot 12^{-3})$$

Exponential Regression

$$Y = a * b^x \qquad P = Q e^{RT}$$

y = END = P

a = START = Q

x = TIME = T

$$(b)^x = (e^R)^T$$

$$b = e^R$$

(PI)

$$R = \log_e(b)$$

$$R = \ln(b)$$

$$R = -.254\ldots$$

25.42% DROP

Lady G Dropping 25% a year ☹

Compound Continuously
($N = \infty$)

$$P = Qe^{RT}$$

If Velveeta has a half-life of 9 months,

1) How much is 5lb block after 18 months?
2) What is its rate of decay?
3) How long will it take to reach 1lb?

1) [5 lb] → (9mos) → [2½] → (9mos) → [1¼ lb]   (1) 1¼ lb.

2) $\frac{2\frac{1}{2}}{5} = \frac{5lbs}{5} e^{R \cdot 9mos}$

(A)

$\frac{1}{2} = e^{R \cdot 9}$

(PI)

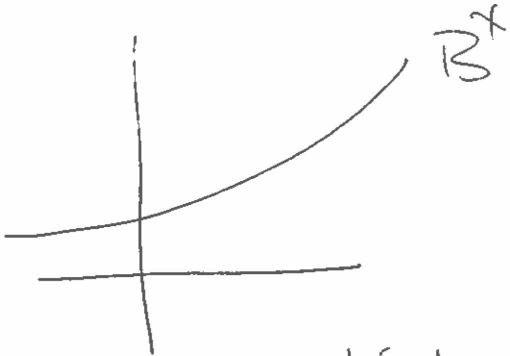
$9R = \log_e(\frac{1}{2})$

$R = \frac{\ln(1/2)}{9} = -.077\ldots$

→ 7.7% decay per month

$P = 1$
$Q = 5$
$R = -.077\ldots$
$T = ?$

20.89... mon



exponential

Compound Interest Formula

$$P = Q\left(1 + \frac{R}{N}\right)^{NT}$$

P - Final Amount
Q = Initial Amount
R = Interest Rate
T = Time
N = # of compounds per period

N = 1 once a year
N = 2 semi-annual
N = 4 quarterly
N = 12 monthly
N = 52 weekly
N = 365 Daily

EX

\$1000 Bond
\$500 Cost
30 years to mature
What's the interest Rate?

N = 12

$$\underset{P}{1000} = \underset{Q}{500}\left(1 + \frac{R}{12}\right)^{12 \cdot 30}$$

$$\frac{1000}{500} = \frac{500}{500}\left(1 + \frac{R}{12}\right)^{12 \cdot 30}$$

$$2 = \left(1 + \frac{R}{12}\right)^{360}$$

$$\sqrt[360]{2} = 1 + \frac{R}{12}$$

$$\sqrt[360]{2} - 1 = R/12$$

$$12\left(\sqrt[360]{2} - 1\right) = R$$

GROUP NAME:

Logo:

Date:

Topics:

Student Names (First and Last)

Speaker/Presenter:

Writer/Prep:

QC/Leader:

Instructions:

GROUP NAME: TTD	Student Names (First and Last)
Logo:	Speaker/Presenter: Dominique
Date: 10/09/13	Writer/Prep: [illegible]
Topics: SALE OF IPHONES	QC/Leader: [illegible]

Instructions:

GROUP NAME: [illegible]

Logo:

Date: 10-9-13

Topics: # of [illegible] vs time; Exponential Regression [illegible]

Student Names (First and Last)

Speaker/Presenter: Jim [illegible]

Writer/Prep: [illegible]

QC/Leader: [illegible]

Instructions:

$P - Qe^{(RT)} = 0$

$t = 43.139$

$Q = 158.29$

$R = -.026$

$T = 50$

TIME	# [illegible]
10	100
[illegible]	[illegible]
[illegible]	24
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

DECAY by 2.6% PER [illegible]

GROUP NAME: I Love Math

Logo: (+ − × ÷)

Date:__________

Topics: China's Population

Student Names (First and Last)

Speaker/Presenter: Lucy Guo

Writer/Prep: Scott

QC/Leader: Rex

Instructions:

$y = a \cdot b^x$

$a = 1.265$ [illegible]

$b = .00$ [illegible]

China's population has grown .5% from 2000 to 2012 due to the [illegible]

y	x
2000	1.263 (billion)
2003	1.288 (billion)
2006	1.311
2009	1.331
2012	1.351

GROUP NAME:

Logo: BC

Date: 10/9

Topics: (D1) Rate of Decay

Student Names (First and Last)

Speaker/Presenter: Stan Kaplan

Writer/Prep: Jal Sinclair

QC/Leader: Danyan Zhou

Instructions:

x	y
2	16
4	15
6	13
8	8
10	6

Ln(.878) = -.130108853

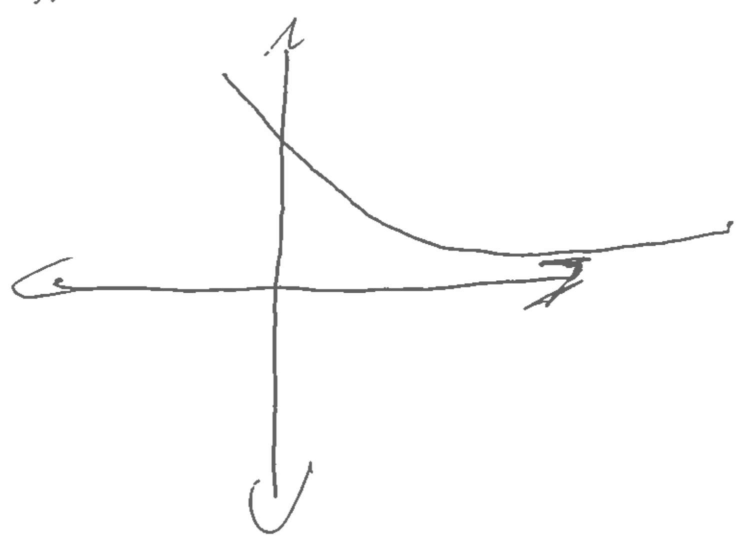
Glasses Sales are going down 13% because of lasik.

STAT → CALC - Opt 10 (ExpReg)

$y = a * b ^ x$

$a = 23.58...$

$b = .878...$



~~MATH - Opt 10 Solver~~

~~Equation Solver~~

~~eqn = 0 = P - Qe^(R*T)~~

~~Enter~~

~~P =~~

~~Q =~~

~~R =~~

~~T =~~

GROUP NAME: I ♡ Meth

Logo:

Date:__________

Topics:

Student Names (First and Last)

Speaker/Presenter: Shanon

Writer/Prep: Avik Khaneja

QC/Leader: Onur Turkan

Instructions: RAM VS Buffer time

L_1	L_2
60	1
30	3
15	5
5	10

$y = a * b^x$

$a = 10.54 \ldots$

$b = .96 \ldots$

$y = P$

$a = a \rightarrow 10.54$

$X = T$

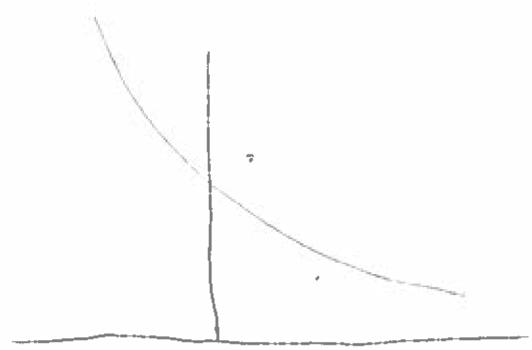
$R = \log(b)$

$P = 10.54e^{\wedge}$

$-.04 \ldots$

↳ -4%

$-.04$



For every ram you get you lose about 4% of buffer time

GROUP NAME: [illegible] **Logo:**	**Student Names (First and Last)** **Speaker/Presenter:** [illegible] **Writer/Prep:** LAUREN [illegible] **QC/Leader:** [illegible]
Date: [illegible] **Topics:** [illegible] mer[illegible]er	

Instructions:

x	y
1	3.0
10	3.[illegible]
[illegible]0	[illegible].5
30	[illegible]
40	7.0
YEAR	POPULATION

$y = a \cdot b^{x}$

$a = 2.2$[illegible]...

$b = 1.0$[illegible]...

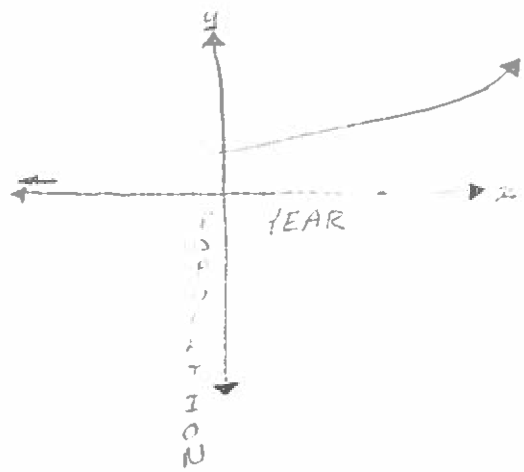
$P = Qe^{rt}$

$P = 4.5$

$Q = 2.8$[illegible]

$r = 0.0219$...

$T = 20$



THERE IS AN EXPONENTIAL GROWTH IN THE [illegible] OF [illegible] BY 2.19 %

GROUP NAME:

Logo: the Darshit group

Date:

Topics:

Student Names (First and Last)

Speaker/Presenter: Darshit

Writer/Prep:

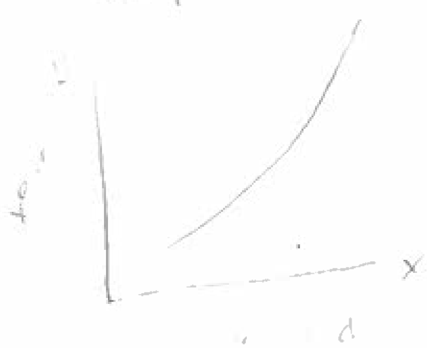
QC/Leader:

Instructions:

Data

Exp Regress (10)

graph



Vars 5, >>, (b)

ln(b) =