$$\int_1^{27} \underbrace{x^{1/3} - x^{-2}}_{f(x)}\, dx$$

$$\frac{x^{4/3}}{4/3} - \frac{x^{-1}}{-1}\Bigg|_1^{27} = F(27) - F(1)$$

$$\left(\frac{3}{4}(27)^{4/3} + 27^{-1}\right) - \left(\frac{3}{4} + 1\right)$$

$$F(27) \quad - \quad F(1)$$

$$\frac{3}{4} \cdot 81 + \frac{1}{27} - \frac{7}{4} = \frac{1594}{27}$$

$$59\ 1/27$$

Position $S(t)$

Velocity $V(t) = \frac{d}{dt} S(t) = S'(t)$

Acceleration $a(t) = \frac{d}{dt}\frac{d}{dt} S(t) = S''(t)$

$\frac{d}{dt} V(t)$.

Initial Value Problem

Velocity $= 20 - \cos t$ $\quad S(0) = 2$

$s'(t) = 20 - \cos t$

$\int s'(t)\,dt = \int 20 - \cos t \, dt$

$s(t) = 20t - \sin t + C$

$s(0) = 20(0) - \sin(0) + C = 2$

$0 - 0 + c = 2$

$c = 2$

$s(t) = 20t - \sin t + 2$

$a(t) = 8 - t \qquad V(0) = 9 \qquad S(0) = 0$

$$\int a(t)\,dt = 8t - t^2/2 + C_1$$

$$V(t) = 8t - t^2/2 + C_1$$

$$V(0) = 0 - 0 + C = 9$$

$$V(t) = 8t - t^2/2 + 9$$

$$\int V(t)\,dt = \frac{8t^2}{2} - t^3/6 + 9t + C_2$$

$$S(0) = 0 - 0 + 0 + C_2 = 0$$

$$C_2 = 0$$

$$S(t) = 4t^2 - \frac{t^3}{6} + 9t$$

differential

Δx = error in x $\approx$ dx

Δy = exact error in y $\approx$ dy

$$dx \cdot \frac{dy}{dx} = f'(x) \cdot dx$$

$$dy = f'(x)\,dx$$

differential

$$d x^2 = 2x\,dx$$

$$d \ln y = \frac{1}{y}\,dy$$

$$d(x^2+y^2) = 2x\,dx + 2y\,dy$$

$$\frac{d}{dx} x^2 = 2x$$

$$\frac{d}{dt} x^2 = 2x \cdot \frac{dx}{dt}$$

$$\frac{d}{dx} \ln y = \frac{1}{y}\frac{dy}{dx}$$

$$\frac{d}{dt} x^2+y^2 = 2x\frac{dx}{dt} + 2y\frac{dy}{dt}$$

Error.

15 501 — 15 500
15499

15000 people at Mercer.

14500

15000 ± 500

5425

15420

15415

15420 ± 5

$43_{yrs.} \pm .5$

Really

43 ± 1

$.43 \pm 10$

$43.5 \pm .5$

$x \quad dx$

1970 ± 5

$1970.0 \pm .05$

Given

$1970 \pm .5$

Area | x

y

$A = xy$

$x = 2.05 \quad y = 1.7$

$dx = \pm .005 \quad dy = .05$

Error!

$$\text{Area} = 2.05 \times 1.7 =$$

$$= 3.485$$

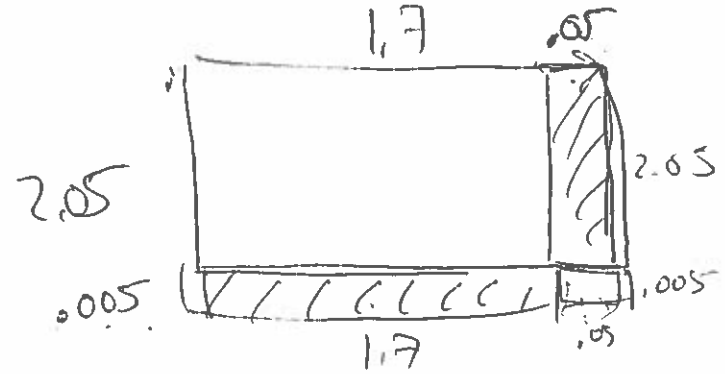
Evaluate Area

Error?

$$dA = x\,dy + y\,dx$$

$$= (2.05)(\pm .05) + (1.7)(\pm .005)$$

$$= .111$$



$3.485 \pm .111$

$dA =$ ~~$\Delta A =$~~ % error

$\frac{.111}{3.485} \times 100 = 3.18\%$

$y = f(x)$ at $x = a$

$dy = f'(x) \cdot dx$

Y_1 = Quad Reg.

Predict: $X = 2015$ TABLE $Y = 23.167$ error?

Find $\frac{dy}{dx}$ $X = 2015$

$\frac{dy}{dx} = 22.79$ m

nderiv(Y_1, X, 15)

$f'(15) \times dX$

Error = $22.79 \times .5 = 11.396$.

~~$2015.5 \pm .5$~~ $2015 \pm .5$

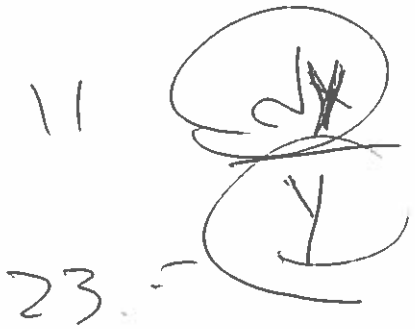
2015 ⟶ 2016 2014.5 ⟶ 2015.5

In 2015 Lady G. is

worth $\underline{22.79 \text{ mil}} \pm 11.7$

$23. \text{ mil} \pm 11 \text{ mil}$

% error 50%



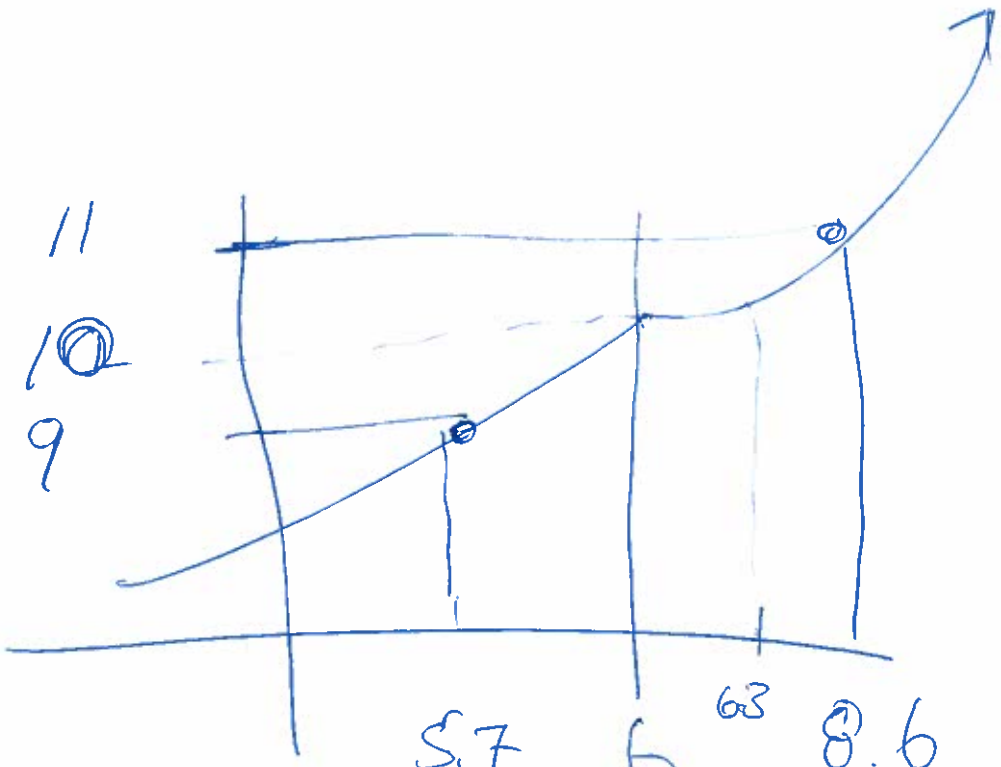
$23_{mil} \pm 50\%$

1. evaluat y at $x = a$
2. evale y' at $x = a$
3. Evaluate $dx = \pm \frac{1}{2}$ (last digit)
4. $dy = y'(a) \cdot dx$
5. Say $y(a) \pm dy$

or

$y(a) \pm$ % error

~2.8 mill $\pm$ .960 .48 17%



$\varepsilon = 1$

$.3 \quad 2.6$

$\delta = .3$

GROUP NAME: Cha-Ching

Date: 4/21/14

Student Names (First and Last)

Speaker/Presenter: Sheila Mae Gan

Writer/Prep: Frenjwot Berele ~~Sheila Mae Gan~~

Leader/Collaborator: Tatiana Calderon, Trey Murrill

Independant Variable (x-axis): Years

Dependant Variable (y-axis): Revenue

Conclusion (in words):

In 2015 we're expecting to make 289.41669 million ± 144.708345 million or an error of 50%

Supporting Work:

DATA

X	Y
13	35
12	27
11	26
10	17
9	16

Y_1 = QuartReg

$X = 15 \quad Y = 287$

$\frac{dy}{dx} = 289.41669 \qquad dx = .5$

error of $f'(15) \times dx$

$289.41669 \times .5$

Error = 289.41669 ± 144.708345

% error $\frac{144.708345}{289.41669} = 50\%$

GROUP NAME:

Date: 04/21

Student Names (First and Last)

Speaker/Presenter: Nader Sherrouda

Writer/Prep: Karol Zarski

Leader/Collaborator:

Independant Variable (x-axis): time (hours)

Dependant Variable (y-axis): memory usage (MB)

Conclusion (in words):

During the 4th hour of use, the memory usage will be 2166.6678752 MB with a % error of 42%.

Supporting Work: Quartic Regression

Prediction: $x = 4$ $y = 2600$ $y'(4) = 2166.6678752$

Error = $y'(4) \cdot .5$

$= \frac{1083.333938}{2600} \cdot 100 = 42\%$

$Y(4) = 2600 \pm 1080$

$\pm 42\%$ error

GROUP NAME:

Date: _____ Illuminatti

Student Names (First and Last)

Speaker/Presenter: Ryan Piotrowski

Writer/Prep: _____

Leader/Collaborator: Danyan Zhou

Independant Variable (x-axis): _____

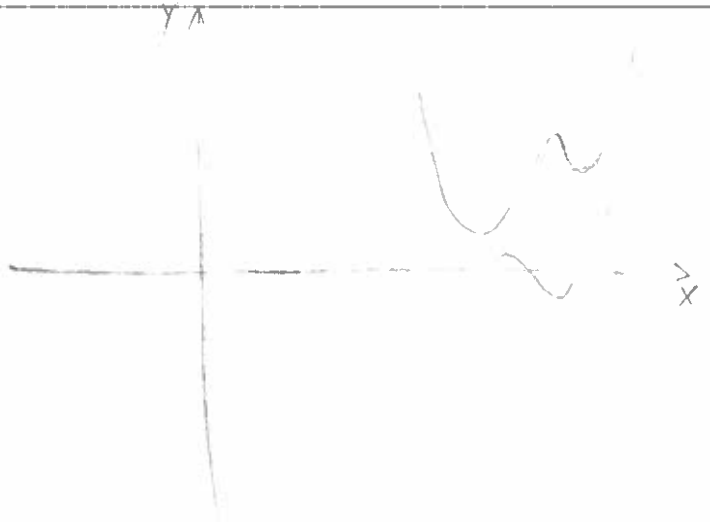
Dependant Variable (y-axis): _____

Conclusion (in words):

gas price in 2008 was ... the error was ...

Supporting Work:

Quad Reg



	1
	1.54
	2.8
	3.5
	3.2

$x = .08$

$y(.08) = 3$

$y'(.08) = 0.0187$

$dx = \pm \frac{1}{2} = \pm 0.5$ year

$dy = y'(a) \cdot dx = 0.0187 \times (\pm 0.5) = \pm$ ...

Error $y(.08) = \pm$ ... 0.24%

GROUP NAME: Trates

Date: 04/21/2014

Student Names (First and Last)

Speaker/Presenter: Sharon Tsoe

Writer/Prep: Onur Turkay

Leader/Collaborator:

Independant Variable (x-axis): time

Dependant Variable (y-axis): Guys

Conclusion (in words): At 7.45pm there will be a 50% chance of no hot guys in the bar between 6.15pm ~~or~~ 8.00 pm.

Supporting Work:

Quart Reg.

Y_1 = Quart reg

2nd calc predict at 7.45pm

$= 4.2196$ → 0 guys

nDeriv(Y_1, x, 19.45)

$- 4.2196$ ± 2 guys

Ans x.5

-2.10973

Ans / -4.2196 50% error.

$.5 \cdot 100$

$= 50$

GROUP NAME: W

Date: 4/21/14

Student Names (First and Last)

Speaker/Presenter: Christina Trujillo

Writer/Prep: Yamin Silva

Leader/Collaborator:

Independant Variable (x-axis): Years

Dependant Variable (y-axis): # of Asylum

Conclusion (in words):

Supporting Work:

X	Y
	20711
	20734
	20580
	19608
2008	8662
	7319
	1058
	12744
	17456

① (Quartic Regression * 2015 = -4.29651406Eai

nDeriv(Y1, X, 5) = -1.0[illegible]VALUES X .5

= -5.2[illegible]

[illegible] X100

-5.2[illegible]

= 200%

GROUP NAME: [illegible]  Date:__________	Student Names (First and Last) Speaker/Presenter: [illegible] Writer/Prep: [illegible] Leader/Collaborator: [illegible]
Independant Variable (x-axis):________________ Dependant Variable (y-axis): ________________	

Conclusion (in words):

Supporting Work:

[illegible]

Prediction - x [illegible]20 y = 7.6[illegible]3

[illegible]

[illegible] = [illegible].6[illegible]1

[illegible] = [illegible] ([illegible]) x [illegible]

69.8[illegible](.5) = [illegible]

$\frac{[illegible]}{1.653}(100)$ = .[illegible]59%

76[illegible] ± 3[illegible]

[illegible] ≈ .[illegible]%

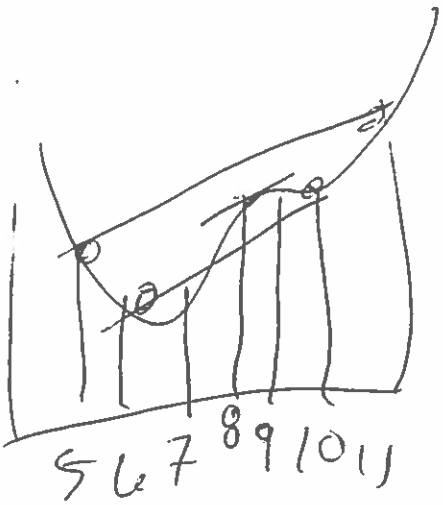
Ex $\int_{-1}^{3} \sinh(x)\,dx = \cosh(x)\Big|_{-1}^{3}$

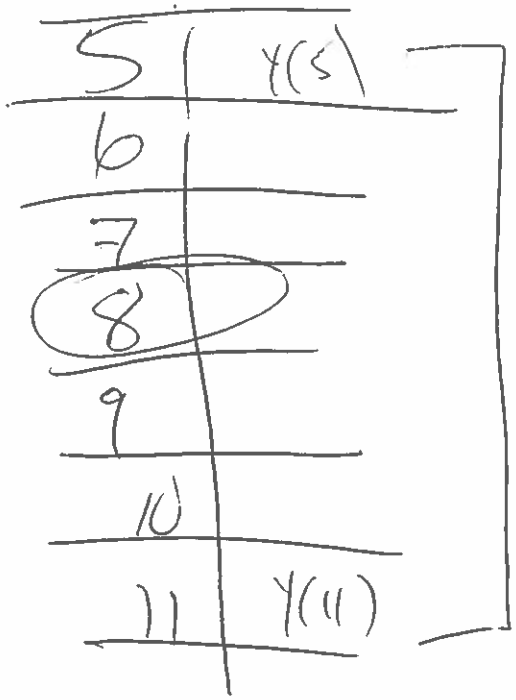
$= \cosh(3) - \cosh(-1)$

$\int_{1}^{27} x^{1/3} - x^{-2}\,dx = \frac{x^{4/3}}{4/3} - \frac{x^{-1}}{-1}\Big|_{1}^{27}$

$= \left(\frac{27^{4/3}}{4/3} - \frac{27^{-1}}{-1}\right) - \left(\frac{1}{4/3} - \frac{1}{-1}\right)$

Initial Value Probles.





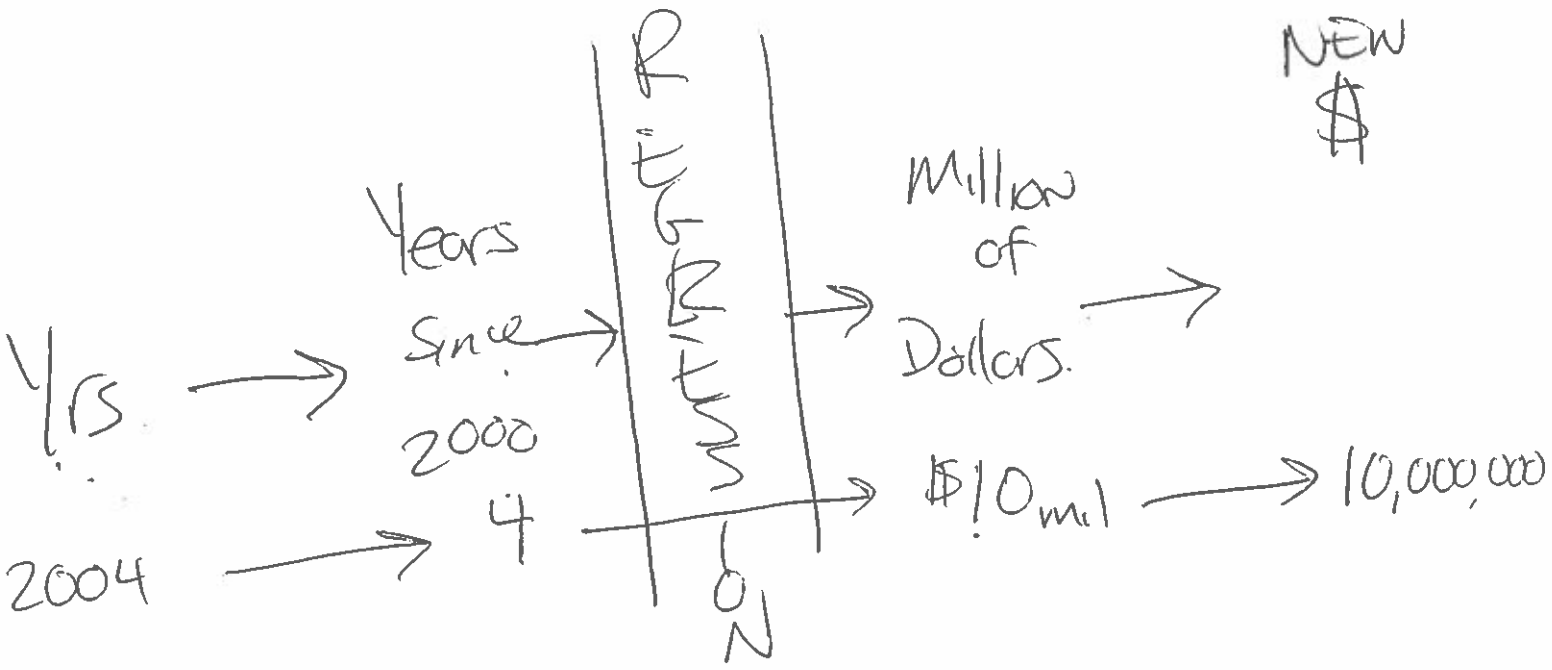
1.24

1.163

1.113

↓

calc. 1.0967



$Y_1 = X - 2000$

$Y_2 = Reg$

$Y_3 = X * 1,000,000$

Yrs

Yrs since 2000

Mil of $

Yrs since 2000

Mil of $

$

X - 2000

reg

X * 1000000

New x	Yrs since 2000	$ in Million
2005 →	5	10
2006 →	6	

New x → Yrs.

Old x → Yrs since 2000

$Y_1 = X - 2000$

X

DATA

Old

Yrs → Decase

Min → Hrs

Dec → Hrs

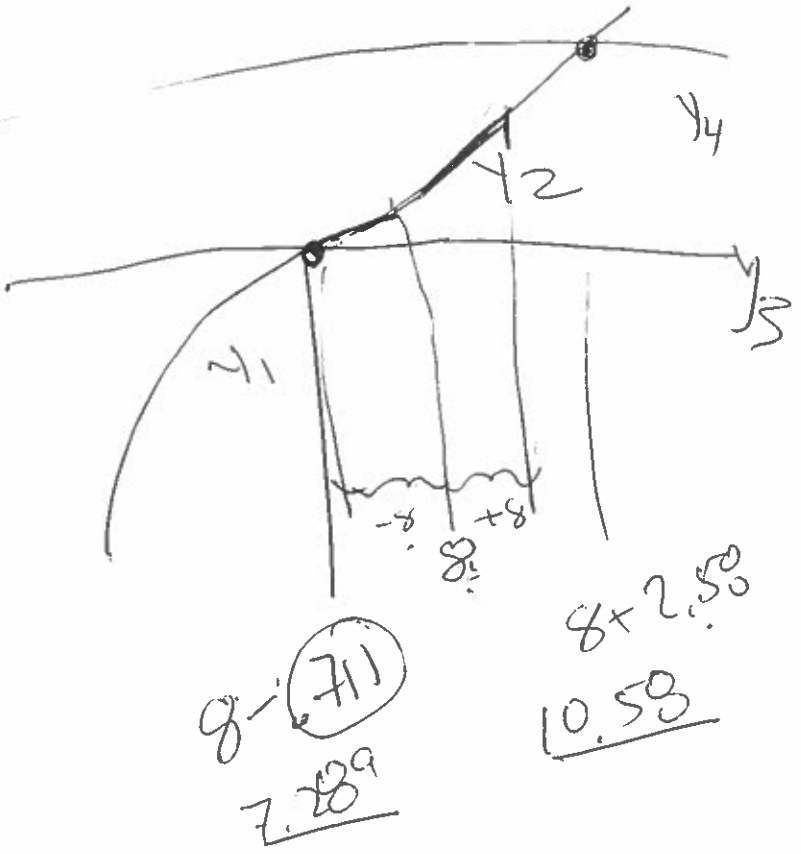
X/10

X/60

X * 24

X ~~*~~ 365

Days since → Yrs Since 2000



$\therefore 13.212$

$y(2008)$

$y_2(2008) - y_1(2008)$

$=$

$$\lim_{x \to 2008} C(x) = \boxed{13.212}$$

$$\varepsilon = 1$$

Interse-

$7.289 \quad \delta \quad 10.5\%$

$-.711 \qquad\qquad +2.58$

$$\boxed{\delta = -.7}$$

before

7 & 9

Ave. Rat

2.02

USG Smog

$y = A\sin(Bx+C)+D$

$y' = A\cos(Bx+C)\cdot B$

Differential

$$\frac{d}{dx} x^2 = 2x$$

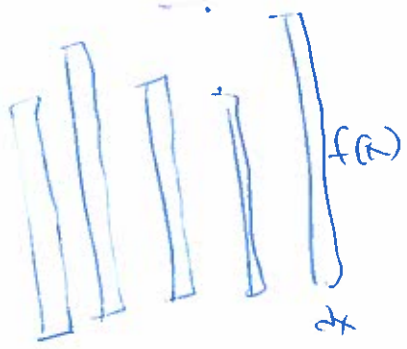
$$\frac{d}{dx} y^2 = 2y \frac{dy}{dx} \quad \text{chain Rule.}$$

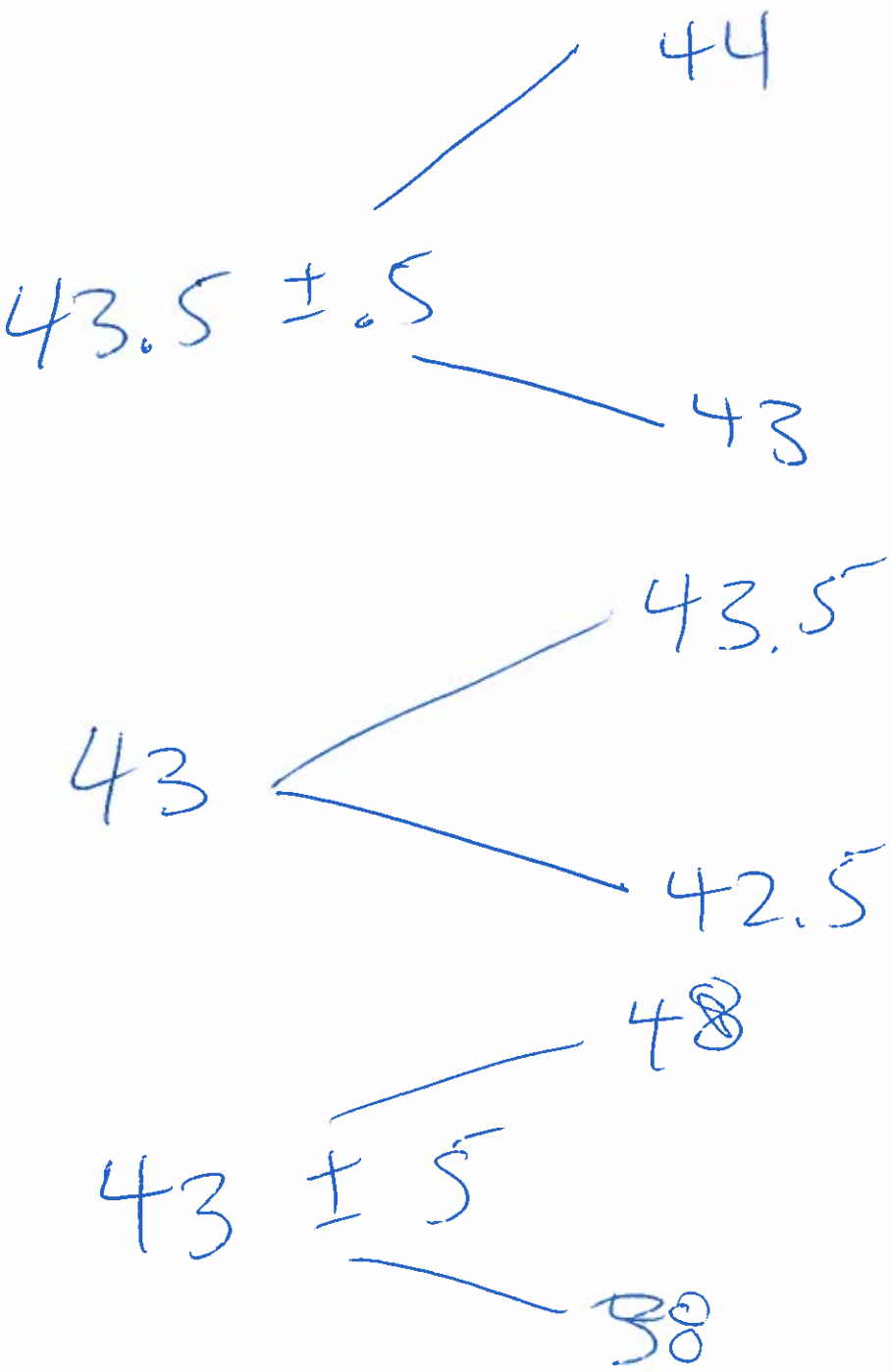
$$\frac{d}{dt} x^2 = 2x \frac{dx}{dt} \quad \text{Related Rate}$$

Differentials (derivative w.r.t. nothing)

$$d(x^2) = 2x\,dx$$

$$\int_a^b f(x)\,dx = \text{Area under } f(x) \text{ between a \& b}$$



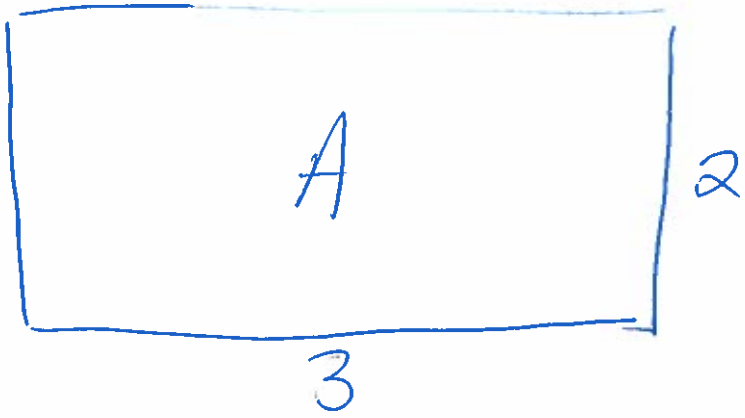


Error in Numbers

15500

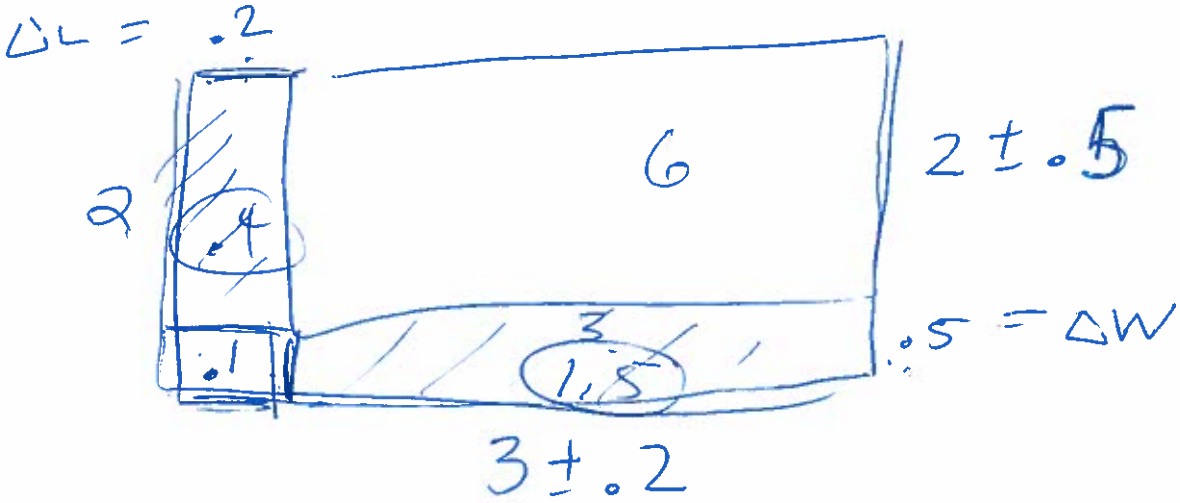
15000

14500



$A = L \times W$

$A = 3 \cdot 2 = 6$



$A = (3.2)(2.5) - 6 =$

$8 - 6 = 2$

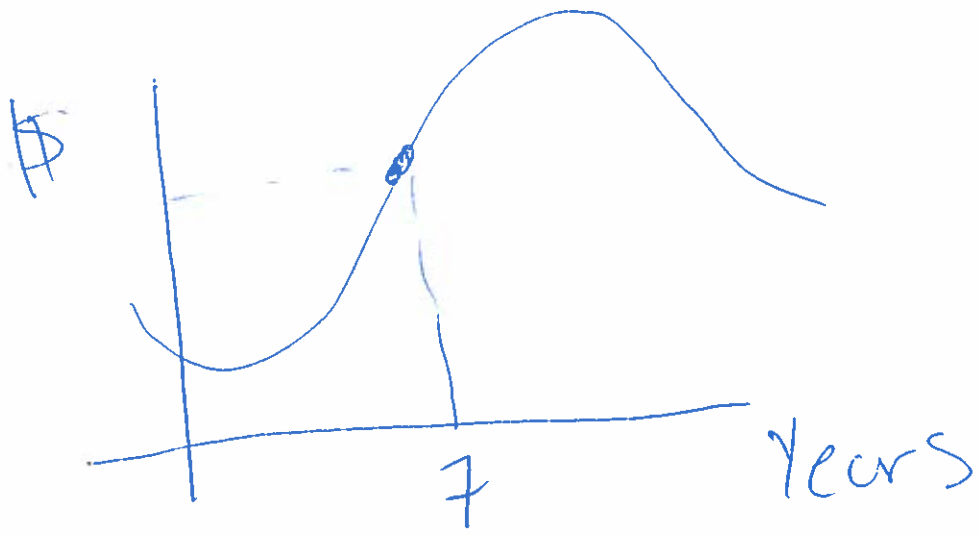
Exact change in area

6 ± 2 ^{2}

$$\frac{dy}{dx} = f'(x)$$

$$dy = f'(x) \cdot dx$$

$10 < \begin{matrix} 10.5 \\ 9.5 \end{matrix}$ $\pm .5$



In Year 7 Lady G was worth 10.9 mil

$3.46 \cdot .5 \longrightarrow \pm 1.7$ error

$\Delta y \approx dy = f'(7) \cdot \frac{dx}{dx = \Delta x} = \frac{\pm .5}{}$

% error

$\frac{1.7}{10.9} \times 100$

15 % error

500 ml ± 100

$\frac{100}{500} \times 100 = 20\%$

20
30
40

$dx = \pm 5$

200
300
400

$dx = \pm 50$

Yrs

2000 $\xrightarrow{X-2000}$

Yrs after 2000

X	y
5	
6	
7	
8	

New X: Years

Old: Yrs after 2000

Fun: X-2000

Old X: Yrs

Old Y: $ in Mil.

Quart

Old y: $ in Mil

New Y: $

X * 1000000

$$y = 1000000 \text{ Reg } (X - 2000)$$

$$y' =$$

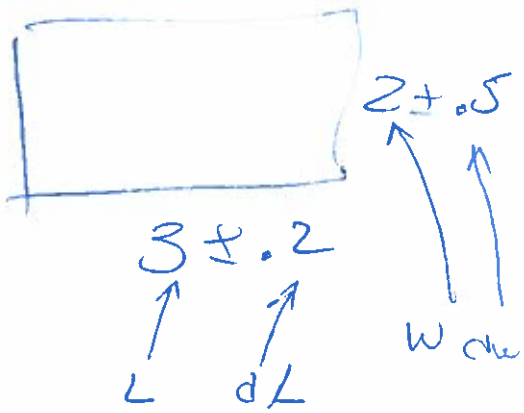
$$A = l \cdot w$$

$$dA = l \cdot dw + w \, dl$$

$$= 3(\pm .5) + 2(\pm .2)$$

$$1.5 \pm .4$$

$$\pm 1.9$$



Ex $E = M \cdot C^2$

Given: $M = 6 \pm .01$ ← dM

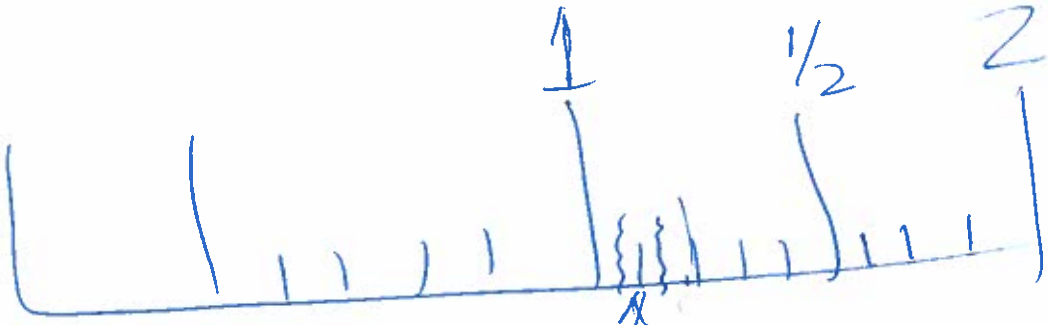
$C = 2 \pm .05$ ← dC

Find error in E?

$$dE = M \cdot 2C \, dC + C^2 \, dM$$

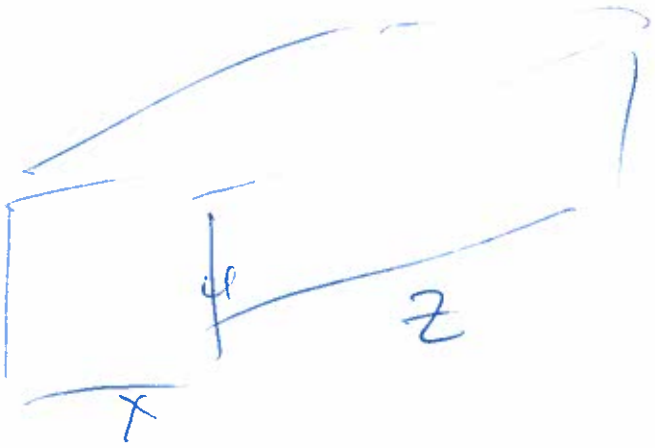
$$= 6 \cdot 2 \cdot 2 \cdot .05 + 2^2 \cdot .01$$

$$= 1.2 + .04 = 1.24$$



$1\frac{1}{8} \pm \frac{1}{16}$

Error



Ex

$$V = xyz$$

$$dV = xy\,dz + xz\,dy + yz\,dx$$