

ϵ - δ Definition of Limit

$$\lim_{x \rightarrow a} f(x) = L$$

The limit L exists if

given any $\epsilon > 0$ you can find a δ set that $|f(x) - L| < \epsilon$ when

$$|x - a| < \delta$$

Ex $\lim_{x \rightarrow 2} 3x - 5 = 1$

Let $\epsilon = .05$ Find $\delta = ?$

$$|f(x) - L| < \epsilon$$

$$|3x - 5 - 1| < .05$$

$$|3x - 6| < .05$$

$$3|x - 2| < .05$$

$$|x - 2| < \frac{.05}{3}$$

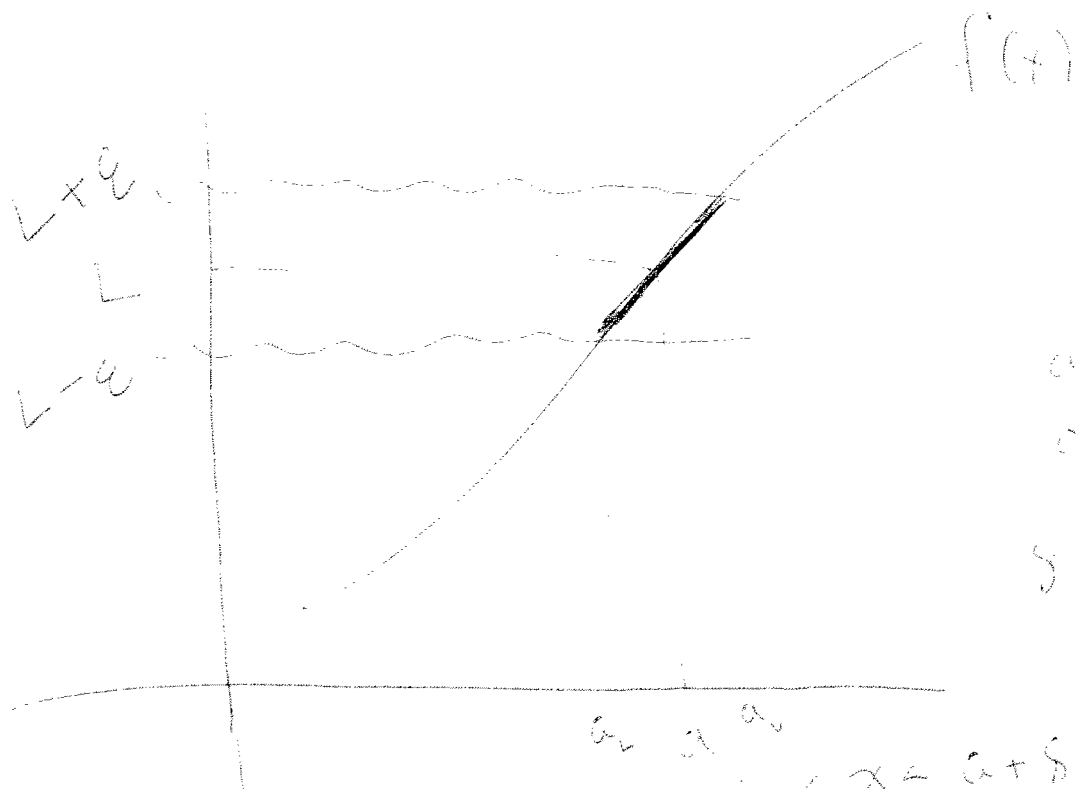
$$|x - a| < \delta$$

$$|x - 2| < \frac{.05}{3} = .01666$$

$$\delta = .01666$$

$$.01666$$

$$.01666$$



$$a_0 - a = \delta_0$$

$$a_1 - a = \delta_1$$

ϵ : smaller
 $\delta > 0$

$$\text{if } a - \delta \leq x \leq a + \delta$$

$$a_1 \leq x \leq a_0$$

$$\text{then } L - \epsilon \leq f(x) \leq L + \epsilon$$

$$-\epsilon \leq f(x) - L \leq +\epsilon$$

$$|f(x) - L| \leq \epsilon$$

$$\text{if } a - \delta \leq x \leq a + \delta$$

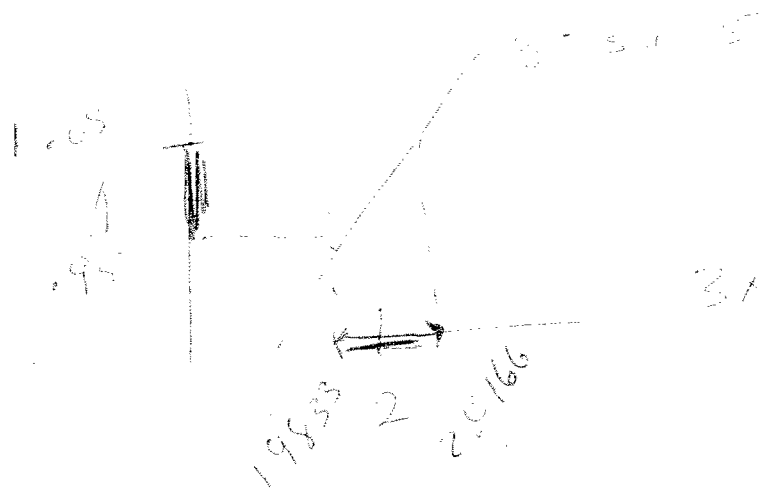
$$-\delta \leq x - a \leq \delta$$

$$|x - a| \leq \delta$$

$\epsilon - \delta$

Definition of Limits

$$\text{if } |x - a| < \delta \text{ Then } |f(x) - L| < \epsilon$$



$$3x - 5 = 1.05$$

$$3x = 6.05$$

$$x = \frac{6.05}{3}$$

$$3x - 5 = 1.05$$

$$3x = 6.05$$

$$x = \frac{6.05}{3}$$

$$2.016666$$

$$x = 2.016666$$

$$x = 2.016666$$

$$x = 2.016666$$

$$x = 2.016666$$

$$x = 2.016666$$

$$x = 1.98333 = 1 \frac{31}{60}$$

$$2 - 1.9833 = \underline{\underline{0.01666}}$$

If my height is between 5.995'
 6.015' then my weight should
 be between 199.9916 and 200

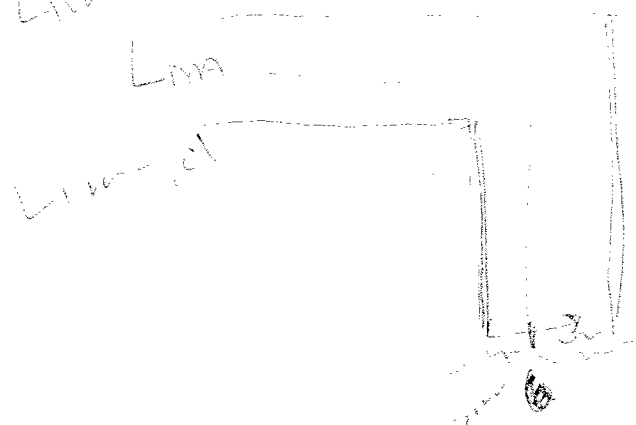
$$| \text{Weight} - L | < .01$$

When

$$| \text{height} - 6 | \leq \boxed{.005}$$

$$5.995 < \text{height} < 6.015$$

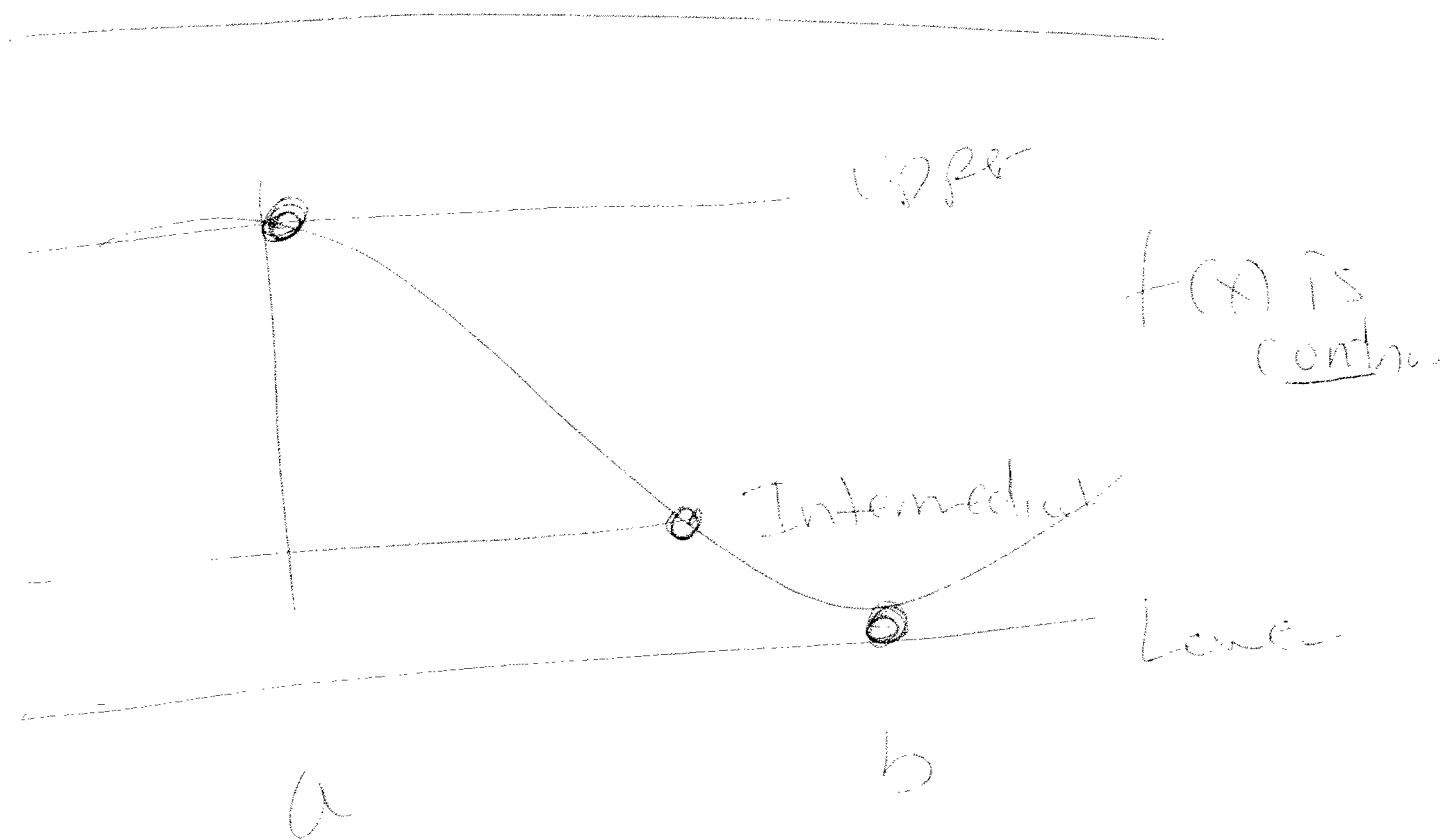
$$L_{\text{min}} + .005$$



at

Intermediate Value Theorem

IVT



$f(x)$ is continuous on $[a, b]$
and you want to know
 $f(x) = L$

$$f(a) \leq L \leq f(b)$$

IVT says there is a value for x so that $f(x) = L$

$$f(x) = x^2 - 7$$

$$f(a) = -7 \quad f(b) = 73$$

is there some x for which $f(x) = 0$? yes

| | |
|--|--|
| GROUP NAME: Logo: | Student Names (First and Last) Speaker/Presenter: _____ Writer/Prep: <u>Logan Lusk</u> QC/Leader: <u>Aidan Colson</u> |
| Date: <u>09/27/2015</u> Topics: | |

Instructions:

| Year (y) | Price (x) |
|----------|-----------|
| 1955.91 | .6303 |
| 1968 | .6111 |

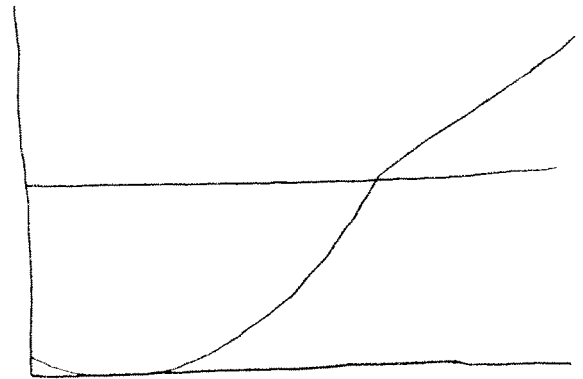
$6111 = x \leq .6303$

$1955.91 \leq y < 1968$

| | |
|--|--|
| <p>GROUP NAME: <u>Wolf Pack</u></p> <p>Logo:</p> | <p>Student Names (First and Last)</p> <p>Speaker/Presenter: <u>Quayshawn Jackson</u></p> |
| <p>Date: <u>9/11/13</u></p> <p>Topics:</p> | <p>Writer/Prep: <u>Jared Schuster</u></p> <p>QC/Leader: <u>Dominic G...</u></p> |

Instructions:

| | |
|--------|-----------|
| 4564.1 | 2002.9999 |
| 4564.2 | 2003 |
| 4564.3 | 2003.0001 |



In the year 2003 within 17 hours and 31 minutes there was a .2 kb change in speed

GROUP NAME: IRISH MATH BOMBS

Logo:



Student Names (First and Last)

Speaker/Presenter: Connor Krusman

Date: _____

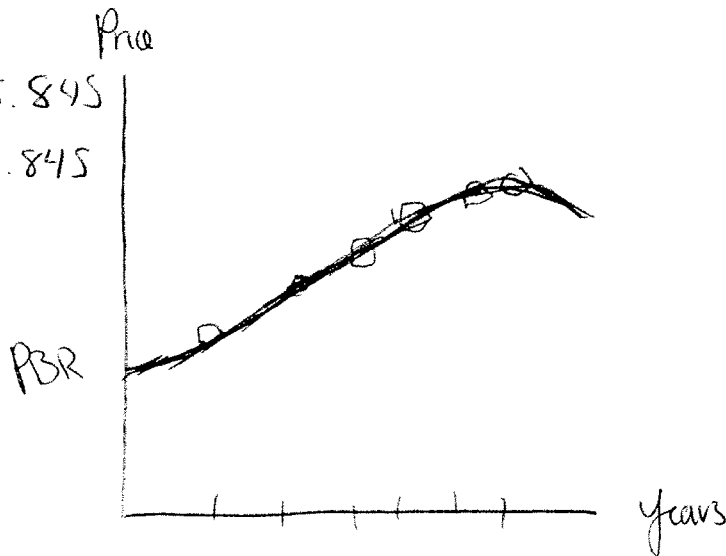
Writer/Prep: Bobby O'Connor

Topics:

QC/Leader: Will Smith Chycah

Instructions:

At $x = 6$ $y' = 15.845$
 $y'' = 15.845$



At $x = 6.00001$, y_1 will be 15.855

At $x = 5.9999$, y_2 will be 15.835

In the year: 2006.0000, the price of PBR will be \$15.855.

In the year 2005.9999, ~~y~~ the price of PBR will be \$15.835

~~Penis~~ Penis

GROUP NAME: Time Is Money



Logo:

Student Names (First and Last)

Speaker/Presenter: Angelika Mazurek

Writer/Prep: Shivam Singh (Shiv)

QC/Leader: Eugenio Pelaez

Date: 9/11/13

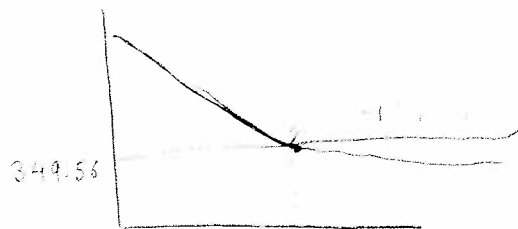
Topics: UNITS

Instructions:

iPhone 4S Sales.

① Going up by .01 from 349.55 to 349.56.

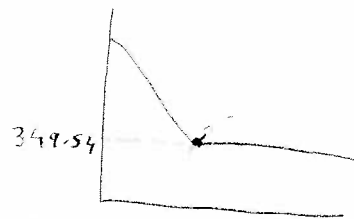
$$x = 3.499875$$



★ In 3.49 years the price of iPhone 4S is \$349.56.

② Going down by .01 from 349.55 to 349.54

$$x = 3.5007608$$



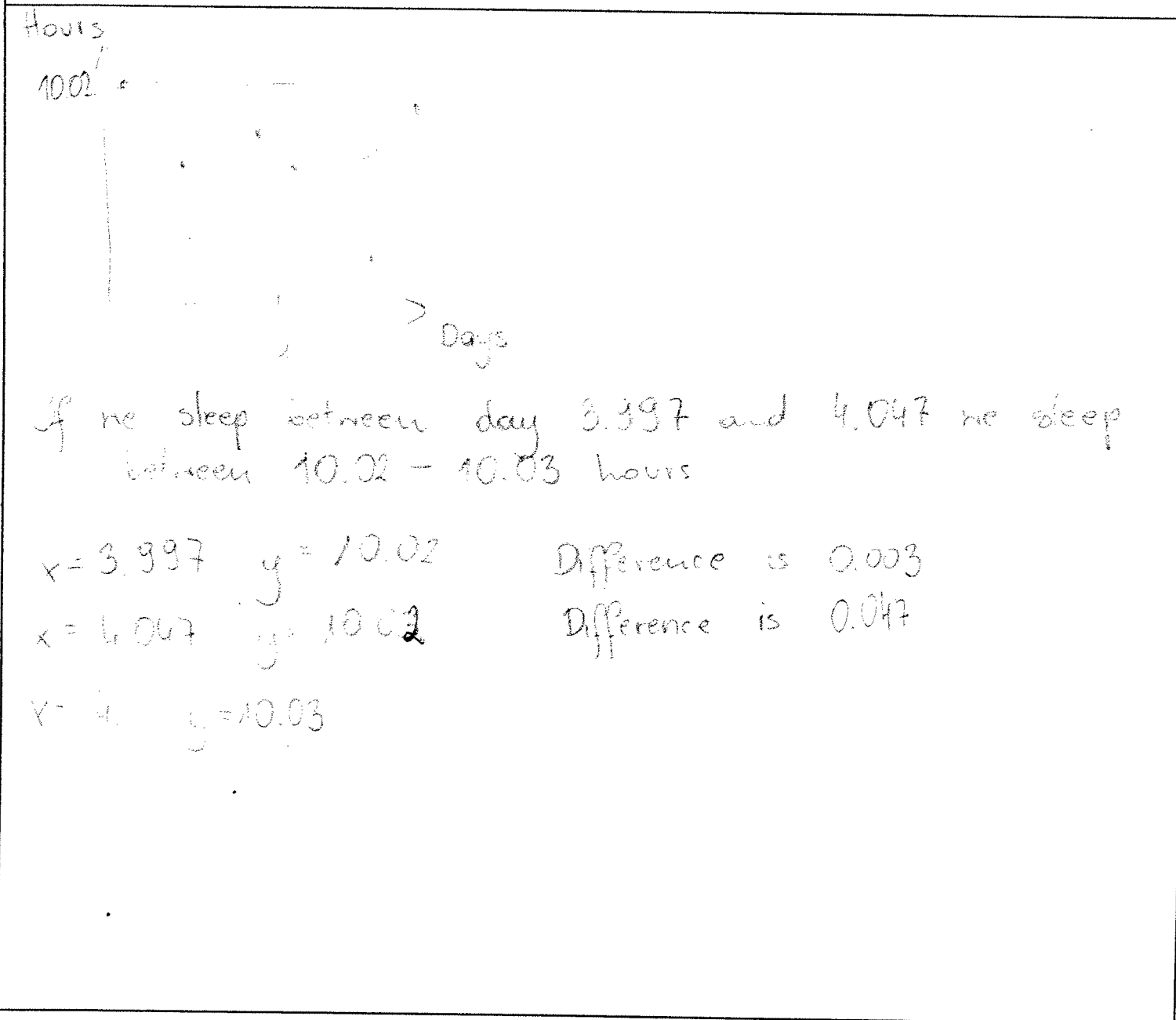
★ In 3.50 years the price of iPhone 4S is \$349.54.

$$\lim_{x \rightarrow 3.5} \text{sales}(Y) = \$349.55$$

In 3.499875 & 3.5007608 years iPhone 4S sales will be \$349.54 & \$349.56.

| | |
|--|--|
| <p>GROUP NAME: <u>Apple 2 Apple</u></p> <p>Logo:</p> | <p>Student Names (First and Last)</p> <p>Speaker/Presenter: <u>Efeve A</u></p> |
| <p>Date: <u>09/17/13</u></p> <p>Topics:</p> | <p>Writer/Prep: <u>Anne S</u></p> <p>QC/Leader: <u>Anne S</u></p> |

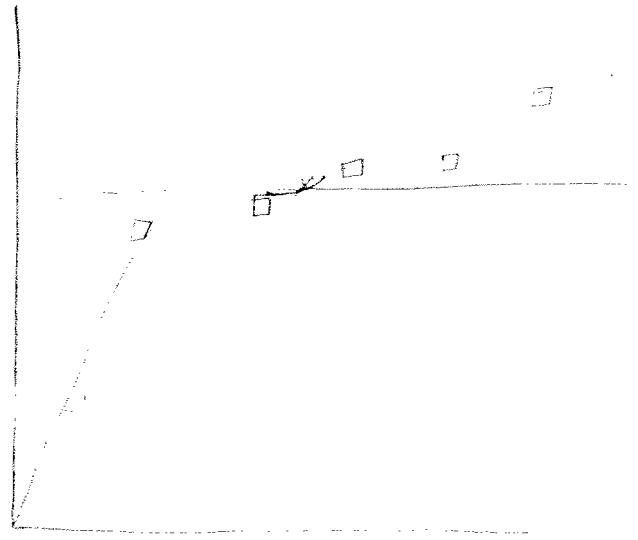
Instructions: find x values within 0.01 of 4.



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|----------------------|---|
| GROUP NAME: | Student Names (First and Last) |
| Logo: | Speaker/Presenter: <u>Donn Ciocotisan</u> |
| Date: <u>9-11-13</u> | Writer/Prep: <u>Kierston Hendrickson</u> |
| Topics: | QC/Leader: <u>Nicole Downall</u> |

Instructions:

2010.75 868.19
 2010.7505 868.2
 2010.7485 868.18



If the time is between 2010.7485 and 2010.7505 then the number of extinct species should be between 868.18 and 868.2

$$\lim_{x \rightarrow 2010.75} \# \text{ of extinct species} = 868.19 \text{ species}$$

$x = 2010.7485$
 $y = 868.18$
 difference = .0015 from 10.75

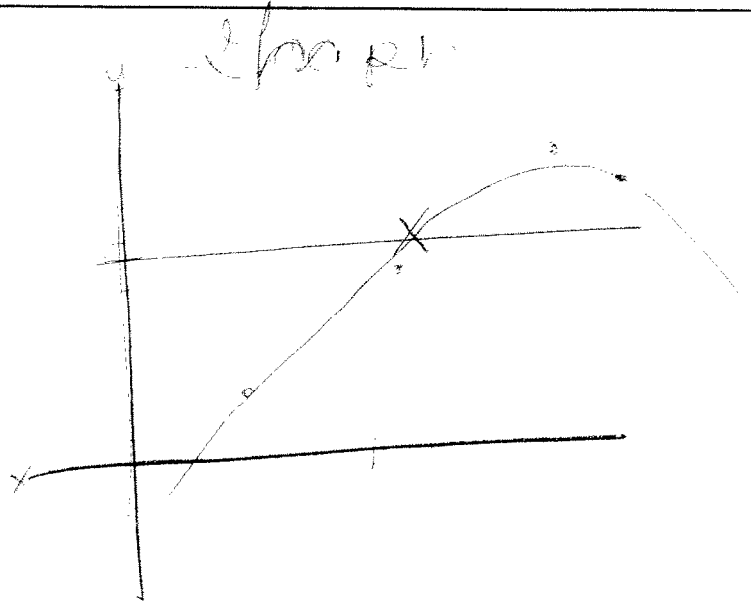
$x = 2010.7505$
 $y = 868.20$
 difference = .0005 from 10.75

| | |
|------------------------|--|
| GROUP NAME: <u>CSC</u> | Student Names (First and Last) |
| Logo: | Speaker/Presenter: <u>Stephensmith</u> |
| Date: <u>9/11/13</u> | Writer/Prep: <u>Courtney Erubel</u> |
| Topics: <u>Limits</u> | QC/Leader: <u>Corneal Douglas</u> |

Instructions: Apple Stock Prices

Data

| yr | Price |
|----|--------|
| 09 | 211.98 |
| 10 | 336.12 |
| 11 | 405.00 |
| 12 | 532.17 |
| 13 | 501.02 |



yt intersects at 433.4

1 For Δt years is between 2010.9987 and 2011.0009. then the price is between 433.2 and 433.4!

$$x = 2010.9987 \quad y = 433.2$$

$$y_3 = 433.4 \quad \text{difference}$$

$$y_4 = 433.2 \quad .0013$$

$$x = 2011.0009 \quad y = 433.4$$

lim Price = 433.3
 $y \rightarrow 2011$

difference is .0009



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0.0.0.25

Job Status: FAILED SMTP Server address is not available.