Agenda

Review Quiz 4- Discuss Test 2

Lecture Newton's Method

Lecture Differentials/ Error

Project: Error

Review Quiz #4

Write your answer in radical form.

Find a value of *c* satisfying the conclusion of the Mean Value Theorem.

$f(x) = x^3 + 8x^2$, [0, 3]

$c =$

Write your answer in radical form.

Find a value of *c* satisfying the conclusion of the Mean Value Theorem.

$f(x) = x^3 + 8x^2$, [0, 3]

$c =$ ☐

MVT

$$f'(c) = \frac{f(b) - f(a)}{b-a}$$

$$f'(x) = 3x^2 + 16x$$

$$f(3) = 27 + 72 = 99$$

$$3x^2 + 16x = \frac{f(3) - f(0)}{3-0}$$

$$3x^2 + 16x = 99$$

$$3x^2 + 16x - 99 = 0$$

$$x = \frac{-16 \pm \sqrt{16^2 - 4 \cdot 3 \cdot (-99)}}{3 \cdot 3}$$

Find the linear approximation at $x = 0$ to show that the valid for "small" x. Compare the approximate and exa your calculations to seven decimal places if needed.

$5\tan(x) \approx 5x$

	$L(x)$	$f(x)$
$x = 0.01$		
$x = 0.1$		
$x = 1$		

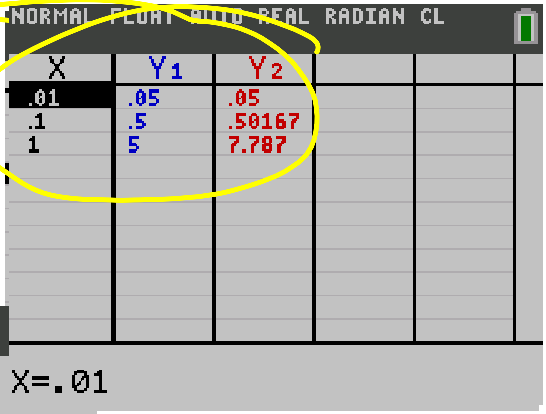
Note: $f(x) = 5\tan(x)$

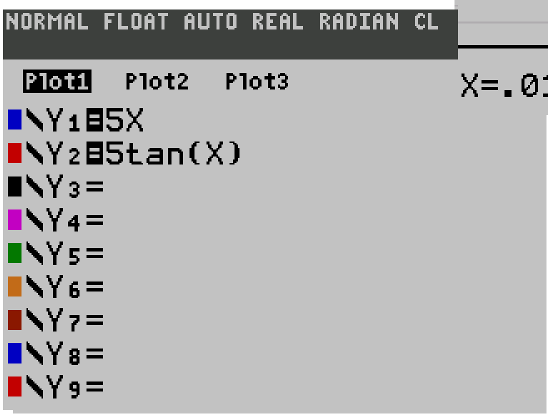
Find the linear approximation at $x = 0$ to show that the valid for "small" x. Compare the approximate and exa your calculations to seven decimal places if needed.

$5\tan(x) \approx 5x$

	$L(x)$	$f(x)$
$x = 0.01$	.05	.05
$x = 0.1$	.5	.50167
$x = 1$	5	7.787

Note: $f(x) = 5\tan(x)$





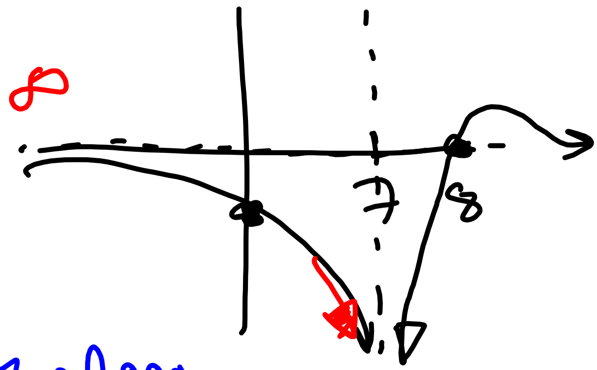
Test 2 Review

$$\lim_{x \to 7^-} \frac{x - 8}{x^2 - 14x + 49}$$

$$\lim_{x \to 7^-} \frac{x-8}{x^2-14x+49}^{\,-} = -\infty$$

$$(x-7)^2 \; +$$

$$x \to \frac{(6.9999) - 8}{(6.999^2 - 14(6.999) + 49)} = -7002000$$



$$\lim_{x \to 7^-} \frac{x-8}{\underbrace{x^2 - 14x + 49}_{<49 \ -98 \ +49}} = -\infty \qquad = \frac{1}{+0}$$

$y_1 = (x-8)/(x^2-14x+49)$

Table

$x = 6.999 \qquad y = -1E6 = -1\times10^6$

$\quad 6.9999 \qquad\qquad -1E10 \quad = -1{,}000{,}000$

#1

Compute the derivative of $f(x) = \sinh^2(9x)$.

#1

Compute the derivative of $f(x) = \sinh^2(9x)$.

chain rule
twice

$$\frac{d}{dx}(\sinh(9x))^2$$

$$2(\sinh(9x))^1 \cdot \frac{d}{dx}\sinh(9x)$$

$$2\sinh(9x)\cosh(9x) \cdot \frac{d}{dx}(9x)$$

$$2 \qquad\qquad\qquad\qquad 9$$

$$\boxed{18\sinh(9x)\cosh(9x)}$$

Find a value of c satisfying the conclusion of the Mean Value Theorem.
Write your answer in radical form.

$f(x) = x^3 + 4x^2$, [0, 3]

$27 + 36 = 63$

$f(3) =$

Ave Rate o Chang $\dfrac{63 - 0}{3 - 0} = 21$

$f'(x) = 3x^2 + 8x$

MVT. $21 = 3x^2 + 8x$

$0 = 3x^2 + 8x - 21$

$x = \dfrac{-8 \pm \sqrt{64 - 4(3)(-21)}}{6}$

Not −
between (0 & 3)

#2

Find a value of c satisfying the conclusion of the Mean Value Theorem. Write your answer in radical form.

$f(x) = x^3 + 4x^2$, [0, 3]

Ave Rate

$$\frac{f(3)-f(0)}{3-0} = \frac{27+36-0}{3} = \frac{63}{3} = 21$$

Instantaneous $f'(x) = 3x^2 + 8x$

$$3x^2 + 8x = 21$$

$$3x^2 + 8x - 21 = 0$$

$$x = \frac{-8 \pm \sqrt{64 - 4(3)(-21)}}{6} \quad \text{on } [0,3]$$

$$\frac{-8 + 2\sqrt{79}}{6}$$

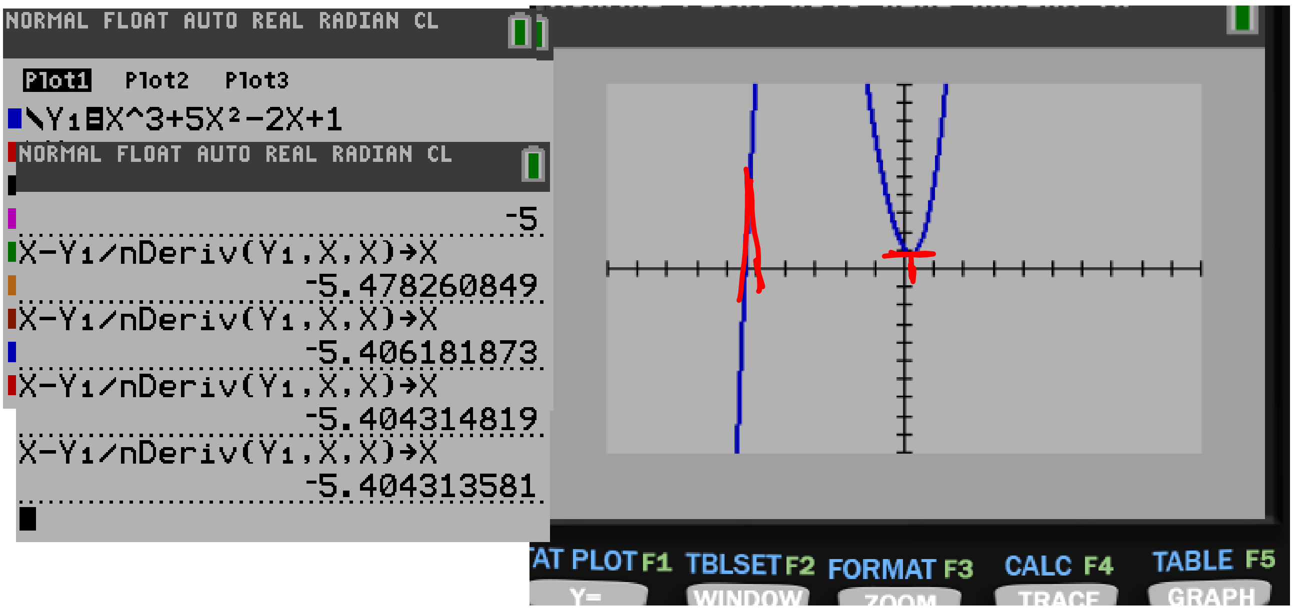
$$\frac{-4 + \sqrt{79}}{3}$$

Use Newton's method to find an approximate root (accurate to six decimal places).

$$x^3 + 5x^2 - 2x + 1 = 0$$

Use Newton's method to find an approximate root (accurate to six decimal places).

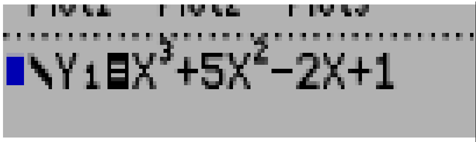
$x^3 + 5x^2 - 2x + 1 = 0$

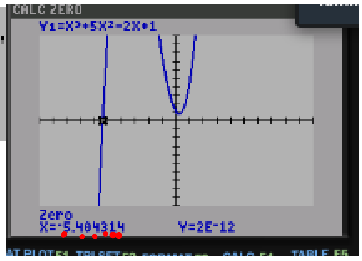


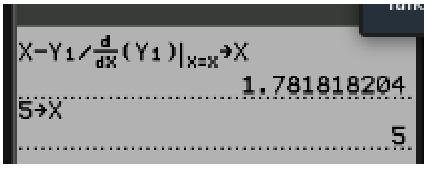
#5

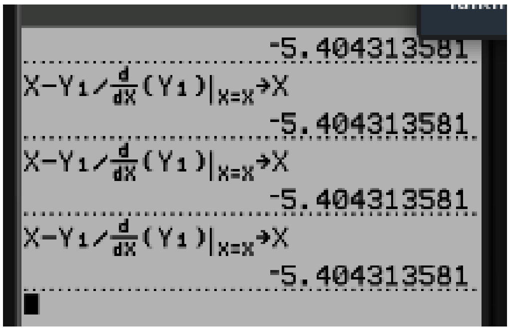
Use Newton's method to find an approximate root (accurate to six decimal places).

$x^3 + 5x^2 - 2x + 1 = 0$









Calc 2: zero

Left: −6

Right: 0

Guess: 0

Use the position function $s(t) = \dfrac{98t}{\sqrt{t^2 + 1}}$ to find the velocity at time $t = 2$.

(Assume units of meters and seconds.)

$v(2) =$ ______ m/s

Use the position function $s(t) = \dfrac{98t}{\sqrt{t^2+1}}$ to find the velocity at time $t = 2$.

(Assume units of meters and seconds.)

$v(2) =$ ☐ m/s

$$s' = \frac{\sqrt{t^2+1}\cdot 98 - 98t \cdot \frac{d}{dt}(t^2+1)^{1/2}}{\left(\sqrt{t^2+1}\right)^2}$$

$$s'(t) = \frac{\sqrt{t^2+1}\cdot 98 - 98t \cdot \frac{1}{2}(t^2+1)^{-1/2}\cdot 2t}{t^2+1}$$

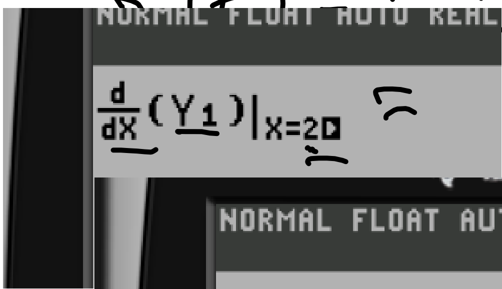
$$s'(2) = \frac{\sqrt{5}\cdot 98 - 98(2)\left(\frac{1}{2}\right)\left(\frac{1}{\sqrt{5}}\right)\cancel{2}\cdot 2}{5} = \frac{98\left(\sqrt{5}-\frac{4}{\sqrt{5}}\right)}{5} = \frac{98}{5\sqrt{5}}$$

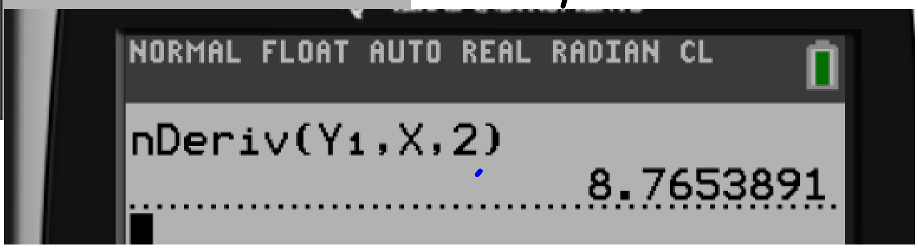
Use the position function $s(t) = \dfrac{98t}{\sqrt{t^2+1}}$ to find the velocity at time $t = 2$.

(Assume units of meters and seconds.)

$v(2) =$ ☐ m/s

$$s'(t) = \frac{\sqrt{t^2+1}\cdot 98 - 98t\,\frac{1}{2}\left(t^2+1\right)^{-1/2}\cdot(2t)}{t^2+1}$$





$$\sqrt{xy} - 7y^2 = 33$$

Implicit

$$\sqrt{xy} - 7y^2 = 33$$

$$\frac{d}{dx}(xy)^{1/2} - \frac{d}{dx}7y^2 = 0$$

$$\frac{1}{2}(xy)^{-1/2}[xy' + y] - 14yy' = 0$$

$$xy' + y - 28\sqrt{xy}\,yy' = 0$$

$$y'(x - 28\sqrt{xy} \cdot y) = -y$$

$$y' = \frac{-y}{x - 28y\sqrt{xy}}$$

$$\frac{d}{dt}\left(\sqrt{xy} - 7y^2\right) = 33 \left(\ \right)$$

$$(xy)^{1/2}$$

$$\frac{1}{2}(xy)^{-1/2} \cdot \frac{d}{dx}(xy) - 14y^1 \frac{dy}{dx} = 0$$

$$\frac{1}{2}(xy)^{-1/2}\left(x\frac{dy}{dx} + y\right) - 14y\frac{dy}{dx} = 0$$

$$\frac{1}{2}x(xy)^{-1/2}\frac{dy}{dx} + \frac{1}{2}y(xy)^{-1/2} - 14y\frac{dy}{dx} = 0$$

$$\frac{dy}{dx}\left(\frac{1}{2}x(xy)^{-1/2} - 14y\right) = -\frac{1}{2}y(xy)^{-1/2}$$

Symbolically find a δ > 0 in terms of ε for

$$\lim_{x \to 4} \left(1 + x/2 \right) = 3.$$

- A. $4\varepsilon = \delta$
- B. $2\varepsilon = \delta$
- C. $\varepsilon/4 = \delta$
- D. $-2\varepsilon = \delta$

Symbolically find a δ > 0 in terms of ε for

$$\lim_{x \to 4} \left(1 + x/2\right) = 3.$$

- A. $4\varepsilon = \delta$ ✓
- B. $2\varepsilon = \delta$
- C. $\varepsilon/4 = \delta$
- D. $-2\varepsilon = \delta$

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

$$\left| 1 + x/2 - 3 \right|$$

$$\left| -2 + x/2 \right|$$

$$\frac{1}{2} \left| x - 4 \right| < \varepsilon$$

$$|x - 4| < 2\varepsilon = \delta$$

Symbolically find a $\delta > 0$ in terms of ε for

$$\lim_{x \to \boxed{4}} (1 + x/2) = \boxed{3}.$$

- A. $4\varepsilon = \delta$
- B. $2\varepsilon = \delta$
- C. $\varepsilon/4 = \delta$
- D. $-2\varepsilon = \delta$

Limit

$$|f(x) - \boxed{L}| < \varepsilon$$

$$\left|1 + \frac{x}{2} - \boxed{3}\right| < \varepsilon$$

$$|2 + x - 6| < 2\varepsilon$$

$$|x - 4| < 2\varepsilon = \delta$$

$$-2\varepsilon < x - 4 < 2\varepsilon$$

$$4 - 2\varepsilon < x < 4 + 2\varepsilon$$

Symbolically find a $\delta > 0$ in terms of ε for

$$\lim_{x \to 4} (1 + x/2) = 3.$$

- A. $4\varepsilon = \delta$
- B. $2\varepsilon = \delta$
- C. $\varepsilon/4 = \delta$
- D. $-2\varepsilon = \delta$

$$\left|1 + \frac{x}{2} - 3\right| < \varepsilon$$

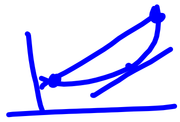
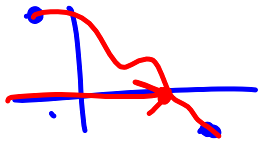
$$\left|\frac{x}{2} - 2\right| < \varepsilon$$

$$\frac{1}{2}|x - 4| < \varepsilon$$

$$|x - 4| < 2\varepsilon = \delta$$

$$x - \delta$$

Calculus Overview

- ✓ Mean Value 
- ✓ Intermediate Value 
- ✓ Squeeze Theorem 

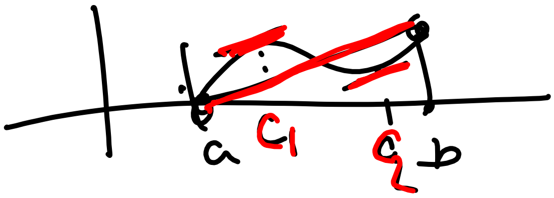
Limits

Fundamental Theorem of Calc.

Apps of Derivative

MVT $f'(c) =$

Instant = Ave. rate.



$y = x^3 + 3x^2$ on $[0,4]$

M.V.T.

A.R.C.

$$\frac{f(4)-f(0)}{4-0} = \frac{112-0}{4-0} = 28$$

I.R.C.

$$y' = 3x^2 + 6x$$

$$3x^2 + 6x = 28$$

$$3x^2 + 6x - 28 = 0$$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(3)(-28)}}{2(3)}$$

$$\frac{-6 \pm \sqrt{36 + 336}}{6}$$

$$\frac{-6 \pm \sqrt{372}}{6}$$

$$\frac{-6 \pm \sqrt{4}\sqrt{93}}{6}$$

$$\frac{\cancel{2}(-3+\sqrt{93})}{\cancel{2} \cdot 3} = \frac{-6 \pm 2\sqrt{93}}{6} = \frac{-3 \pm \sqrt{93}}{3}$$

on $[0,4]$ $\quad \frac{-3+\sqrt{93}}{3}$

Check the Mean Value Theorem and find a value of c that makes the appropriate conclusion true. Round your answer to two decimal places.

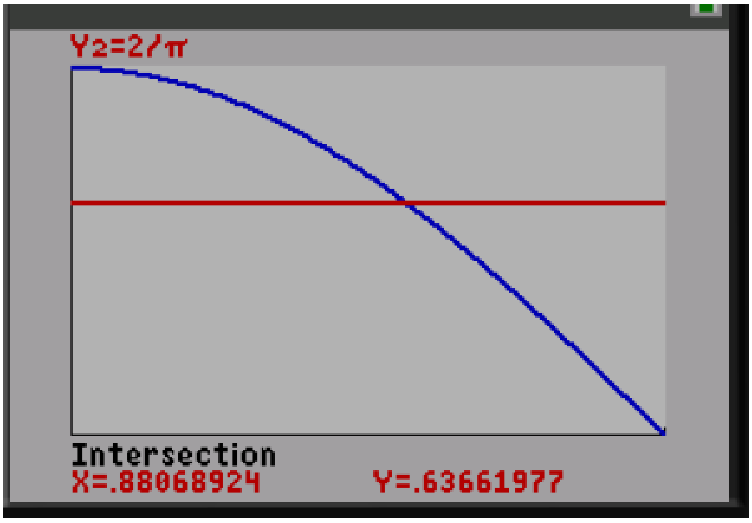
$$f(x) = \sin x + 97, \quad \left[0, \frac{\pi}{2}\right]$$

Check the Mean Value Theorem and find a value of c that makes the appropriate conclusion true. Round your answer to two decimal places.

$f(x) = \sin x + 97, \left[0, \frac{\pi}{2}\right]$

$$\frac{\sin 0 + \cancel{97} - \left(\sin\frac{\pi}{2} + \cancel{97}\right)}{0 - \pi/2} = \frac{-1}{-\frac{\pi}{2}} = \frac{2}{\pi}$$

$$f'(x) = \boxed{\cos x = \frac{2}{\pi}}$$



Local Linear Approx.

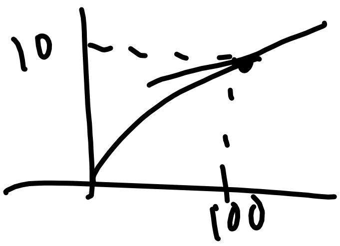
$\sqrt{101} \approx$ $f(x)=\sqrt{x}$

$(100, 10)$ $x_0 = 100$

$y_0 = 10$

$$f(x) \approx f(x_0) + f'(x_0)(x-x_0)$$

$$y = y_0 + m(x-x_0)$$



Point (x_0, y_0)

Slope m

$\sqrt{5} \approx 2..$

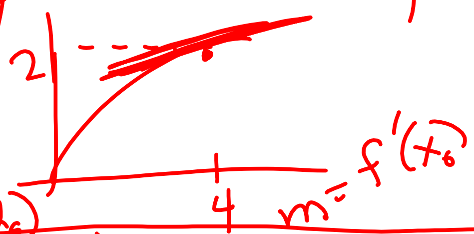
around $\sqrt{4} = 2$

$f(x) = \sqrt{x}$ Center $x=4,\ y=2$

$(4,2)$

$f'(x) = \frac{1}{2}x^{-1/2}$

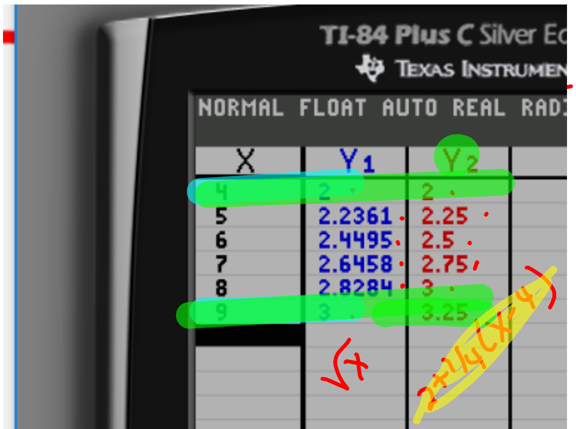
$f'(4) = \frac{1}{2}\cdot\frac{1}{2} = \frac{1}{4}$ Slope $= 1/4$



(Line) (y_0) $m = f'(x_0)$

$$\boxed{f(x) \approx f(x_0) + f'(x_0)(x - x_0)}$$

$$\sqrt{x} \approx 2 + \frac{1}{4}(x-4)$$



TI-84 Plus C Silver Ed

Texas Instrumen

NORMAL FLOAT AUTO REAL RAD

X	Y_1	Y_2
4	2	2
5	2.2361	2.25
6	2.4495	2.5
7	2.6458	2.75
8	2.8284	3
9	3	3.25

$\sqrt{x}$ $2 + 1/4(x-4)$

$\frac{1}{4}(5-4)$

$\approx 2\frac{1}{4}$

$\frac{1}{4}(6-4)$

$\approx 2\frac{1}{2}$

$\sqrt{7} \approx 2 + \frac{1}{4}(7-4)$

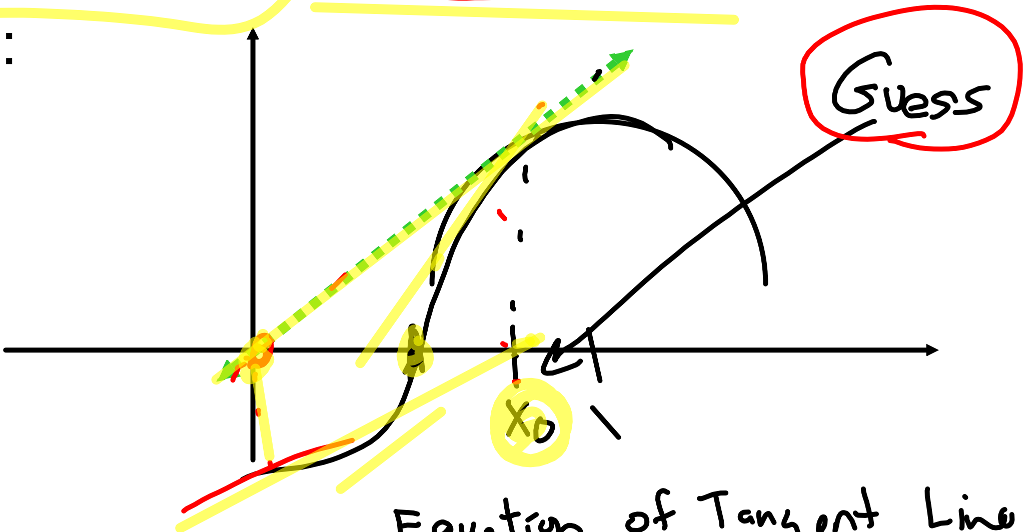
$\approx 2\frac{3}{4}$

$\sqrt{8} \approx 2 + \frac{1}{4}(8-4)$

≈ 3

Newton's Method (for finding zeros)

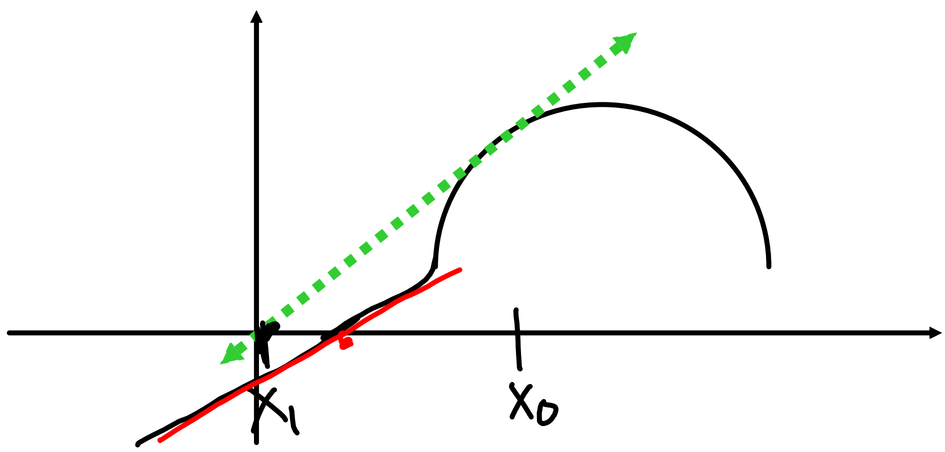
Idea:



Equation of Tangent Line

$$y = y_0 + f'(x_0)(x - x_0)$$

Newtons Method



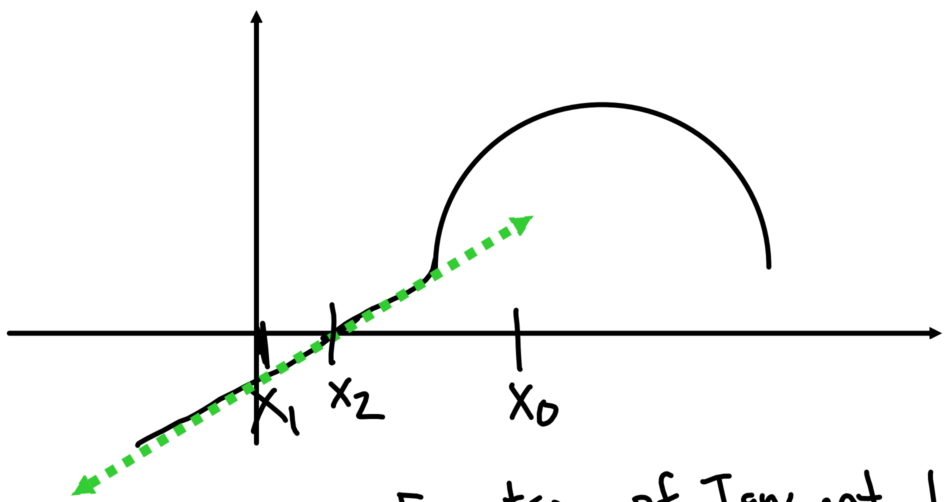
Equation of Tangent Line

$$y = y_0 + f'(x_0)(x - x_0)$$

$$0 = y_0 + f'(x_0)(x - x_0)$$

$$x = x_0 - \frac{y_0}{f'(x_0)} \Rightarrow x_1$$

Newtons Method



Equation of Tangent Line

$$y = y_1 + f'(x_1)(x - x_1)$$

$$0 = y_1 + f'(x_1)(x - x_1)$$

$$x = x_1 - \frac{y_1}{f'(x_1)} \Rightarrow x_2$$

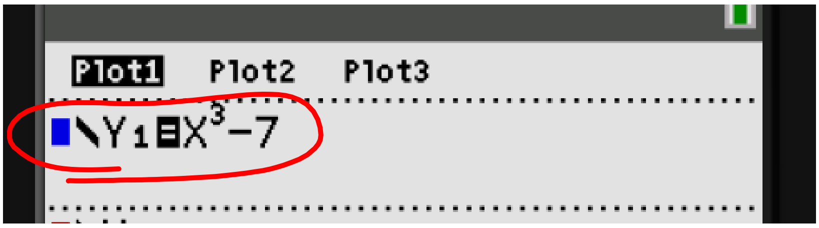
Repeat . . . . . .

$$\boxed{x_{n+1} = x_n - f(x_n)/f'(x_n)}$$

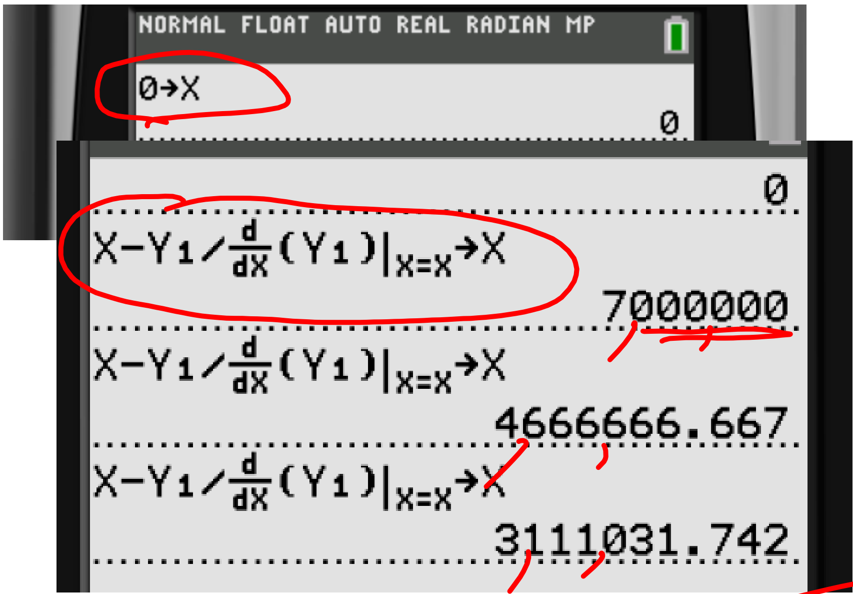
New $\quad$ Old $\quad$ — $\quad \dfrac{\text{Function at old value.}}{\text{Derivative .}}$

Eventually settles on answer.

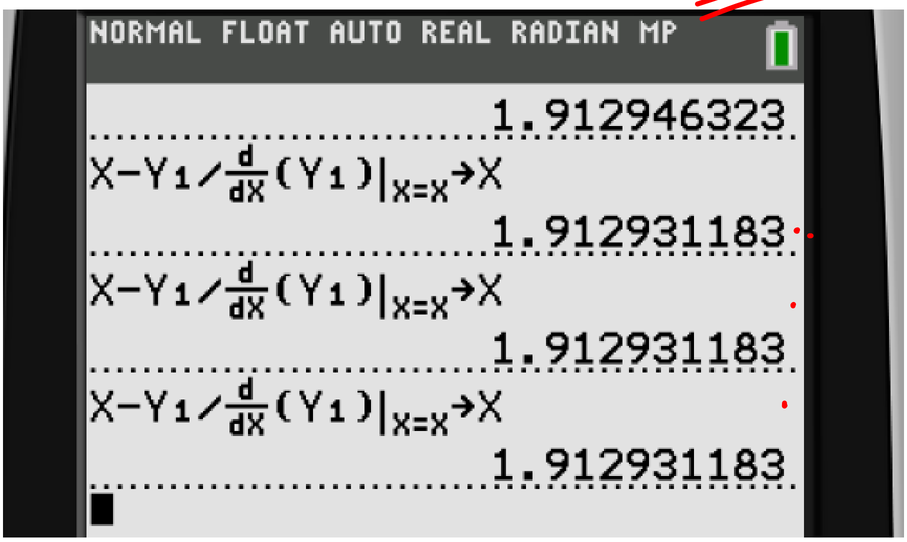
Ex Solve $y = x^3 - 7 = 0$ $x^3 = 7$



Guess ≈ 0



$$x^3 = 7$$
$$-7 \quad -7$$
$$x^3 - 7 = 0$$



$$x^3 - 7 = 0$$
$$x^3 = 7$$
$$x = 1.91\ldots$$

A certain parasite is an enemy of a specific type of tree. In one model of the interaction between these organisms, possible long−term populations of the parasite are the solution of the equation $r(1 - x/k) = 5x/(1 + x^2)$, for constants r and k. Find all possible solutions of the equation with $r = 2.5$ and $k = 7$.

Your Answer:

A certain parasite is an enemy of a specific type of tree. In one model of the interaction between these organisms, possible long-term populations of the parasite are the solution of the equation $\boxed{r(1 - x/k) = 5x/(1 + x^2)}$, for constants r and k. Find all possible solutions of the equation with $r = 2.5$ and $k = 7$.

Your Answer:

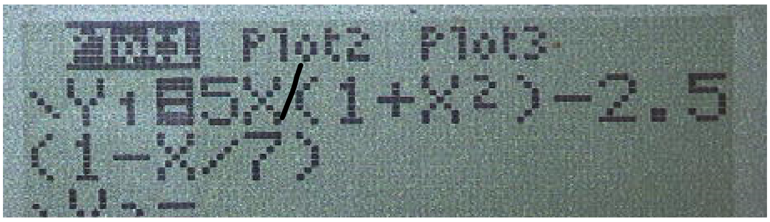
$$\boxed{2.5\,(1 - x/7) = 5x/(1 + x^2)}$$

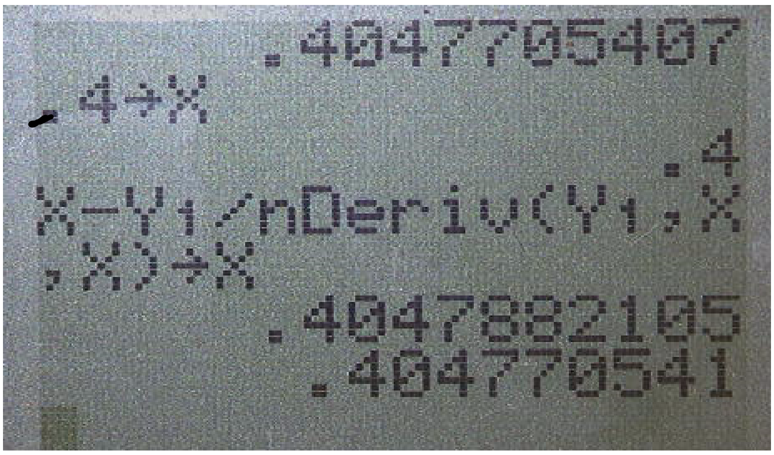
$$5x/(1+x^2) - 2.5(1 - x/7) = 0$$

Solve for x?

Newtons.

$Y_1 = \ldots$





1. Solver
2. Intersect
3. Newton's
4. Graph. Find Zeros

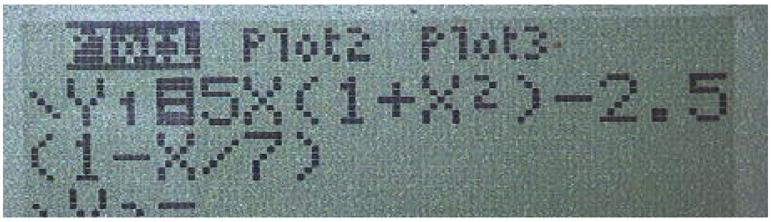
A certain parasite is an enemy of a specific type of tree. In one model of the interaction between these organisms, possible long−term populations of the parasite are the solution of the equation $r(1 - x/k) = 5x/(1 + x^2)$, for constants r and k. Find all possible solutions of the equation with $r = 2.5$ and $k = 7$.

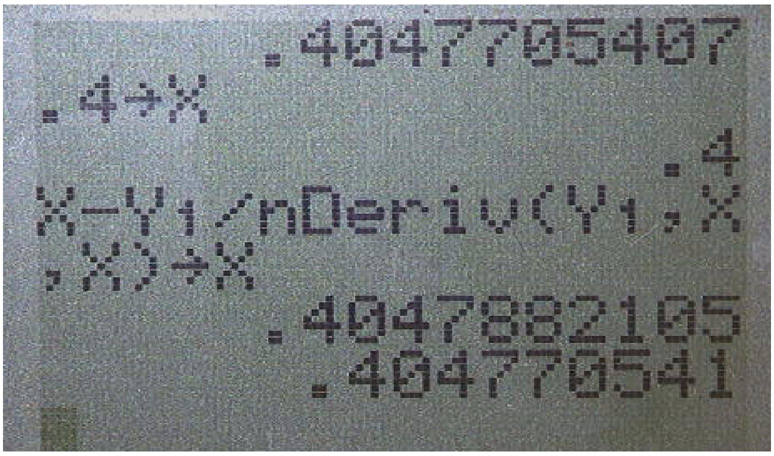
Your Answer: .404..

Solu

$$2.5\left(1-\frac{x}{7}\right) = \frac{5x}{1+x^2}$$

$$0 = 5x/(1+x^2) - 2.5(1-x/7)$$





Give your final answers as reduced improper fractions.

Use Newton's method with the given x_0 to compute x_1 and x_2 by hand.

$x^3 + 5x^2 - 7 = 0$, $x_0 = 1$

Give your final answers as reduced improper fractions.

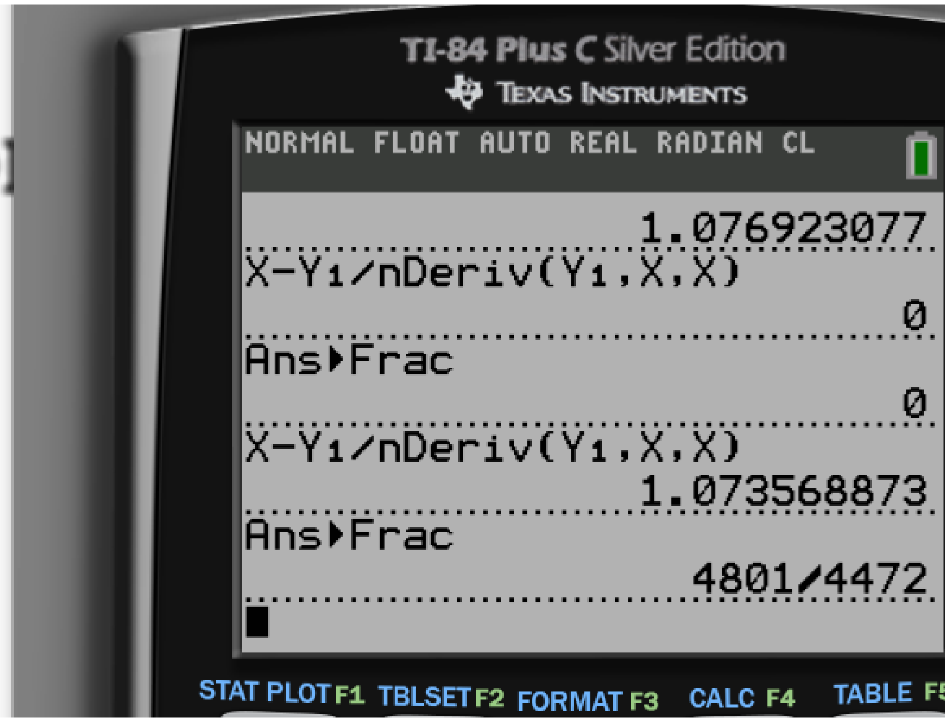
Use Newton's method with the given x_0 to compute x_1 and x_2 by hand.

$x^3 + 5x^2 - 7 = 0$, $x_0 = 1$

$$x_0 = 1$$

$$x_1 = 1 - \frac{1^3 + 5(1)^2 - 7}{3(1)^2 + 10(1)} = 1 - \frac{-1}{13} = \frac{14}{13}$$

$$x_2 = \frac{14}{13} - \frac{(14/13)^3 + 5(14/13)^2 - 7}{3(14/13)^2 + 10(14/13)} =$$

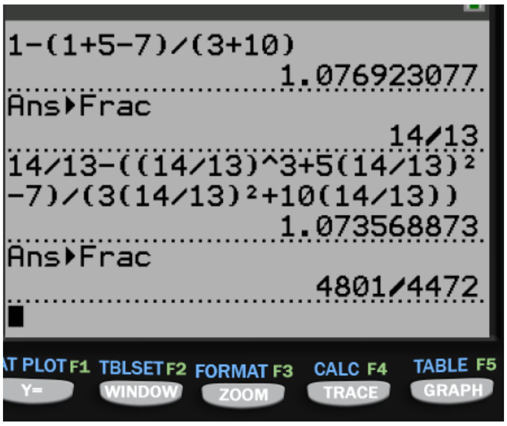


Give your final answers as reduced improper fractions.

Use Newton's method with the given x_0 to compute x_1 and x_2 by hand.

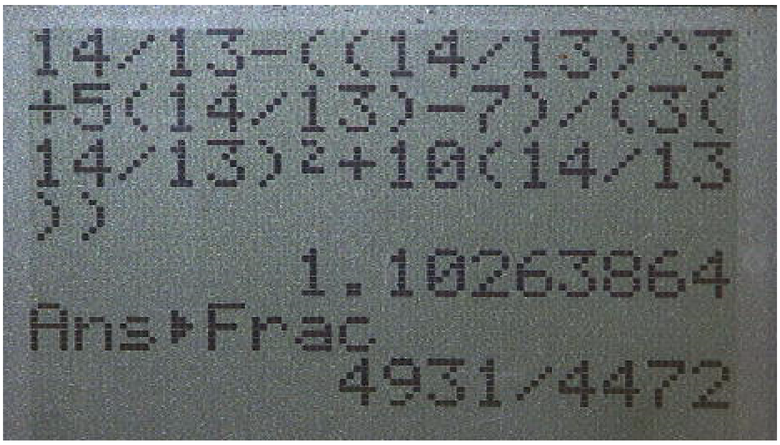
$x^3 + 5x^2 - 7 = 0,\ x_0 = 1$

$$x - \frac{x^3 + 5x^2 - 7}{3x^2 + 10x}$$



$$1 - \frac{1+5-7}{3+10} = \frac{14}{13}$$

$$\frac{14}{13} - \frac{(14/13)^3 + 5(14/13)^2 - 7}{3(14/13)^2 + 10(14/13)}$$



Give your final answers as reduced improper fractions.

Use Newton's method with the given x_0 to compute x_1 and x_2 by hand.

$x^3 + 5x^2 - 7 = 0,\ x_0 = 1$

$$y = x^3 + 5x^2 - 7$$

$$y' = 3x^2 + 10x$$

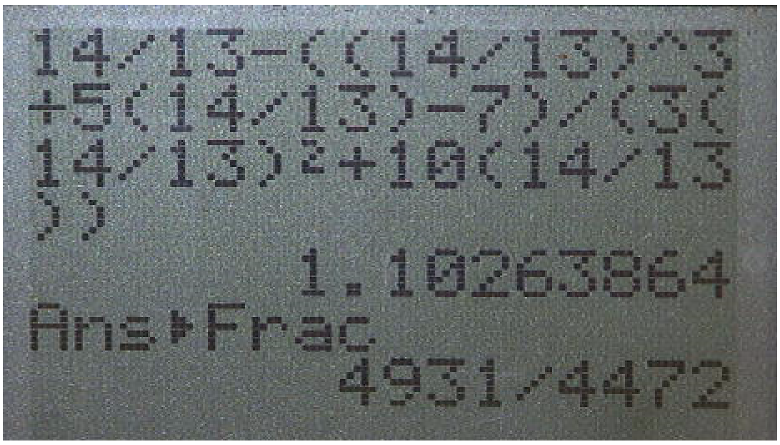
$$\cancel{1}\,\frac{14}{13} - \frac{Y_1(\cancel{X}\,\frac{14}{13})}{Y_1'(\cancel{X}\,\frac{14}{13})}$$

$$1 - \frac{-1}{13} = \frac{14}{13}$$

$$y\left(\frac{14}{13}\right) = \left(\frac{14}{13}\right)^3 + 5\left(\frac{14}{13}\right) - 7$$

$$y'\left(\frac{14}{13}\right) = 3\left(\frac{14}{13}\right)^2 + 10\left(\frac{14}{13}\right)$$

$$\frac{14}{13} - \frac{\bigcirc}{\square} = \text{NASTY}$$




Ans-Y1(Ans)/nDer
iv(Y1,X,Ans)

Use Newton's method to approximate $\sqrt[3]{16}$.

Round your final answer to nine decimal places.

Your Answer:

$\sqrt[3]{16} = x$

$x - \sqrt[3]{16} = 0$

$x^3 - 16 = 0$

Use Newton's method to approximate $\sqrt[3]{16}$.

Round your final answer to nine decimal places.

Your Answer:

$Y_1 = x^3 - 16$ $\quad x_0 = 2$

$x = \sqrt[3]{16}$

$2 \to x$

$x^3 = 16$

$x - Y_1 / \text{nderiv}(Y_1, x, x) \to x$

$x^3 - 16 = 0$

$x_1 = 2 - \dfrac{2^3 - 16}{3 \cdot 2^2} =$

Use Newton's method to approximate $\sqrt[3]{16}$.

Round your final answer to nine decimal places.

Your Answer: [ ]

$(x)^3 = (\sqrt[3]{16})^3$

$x^3 = 16$

$0 = x^3 - 16$

Differentials

$$dx \longrightarrow \frac{d}{dx}$$

$$\boxed{\frac{d}{dx}}\, y^2 = 2y \quad d(y^2)$$

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

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

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

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

Differential

$$f'(x) \equiv \frac{d}{dx} f(x)$$

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

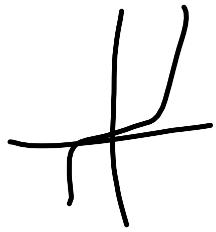
$$d f(x) = f'(x) \cdot dx$$

Differential $d f(x) = f'(x)\, dx$

1 Take derivative w.r.t Nothing

Ex

$$\boxed{y = x^3}$$



$$\frac{dy}{dx} = 3x^2 \leftarrow \boxed{dy} = \boxed{3x^2}\,\boxed{dx}$$

$$\Delta y \approx \boxed{dy} = f'(x)\,dx$$

Exact change in y

$$\Delta y = y_2 - y_1$$

$$dy =$$

$\boxed{\text{ERROR}}$

X — Number (dx) 1

1.5

.5

$\boxed{\text{error} \pm .5}$ = dx

1995.5

1995

1994.5

dx = ± .5

1.0

1.05

.95

± .05

$$6523 < \begin{matrix} 6523.5 \\ 6522.5 \end{matrix}$$

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

$\pm \frac{1}{2}(1)$

$$\underline{\underline{7000}} < \begin{matrix} 7500 \\ 6500 \end{matrix}$$

$dx = \pm\frac{1}{2}(1000)$

$\approx \pm 500$

$$6500 < \begin{matrix} 6550 \\ 6450 \end{matrix}$$

$\pm\frac{1}{2}(100) = dx \pm 50$

$\underline{6.5}0\underline{0} \times 10^3$

Project: Error

y1=regression

y2=nderiv(y1, x, x) * __0.5_____ error

y3= y2 / y1 * 100 % error

$$y = f(x)$$

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

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

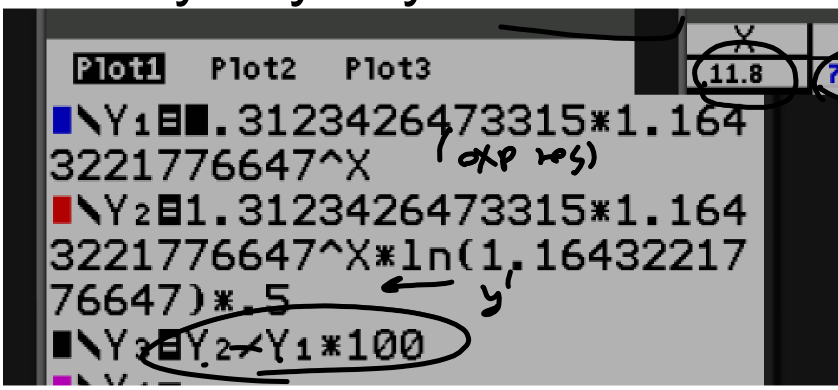
error in number

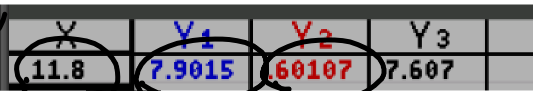
derivative

y= y1=regression $f'(x) = \frac{dy}{dx}$

dy = y2=nderiv(y1, x, x) * __0.5______ error

y3= y2 / y1 * 100 % error





7.9 ± .6

%error 7.6

write $r(95) = 10$

$r'(95) * .5 = .5$ $\quad r(95) / r'(95) \cdot 100$

$= .005$

	y1=regress	y2=error	y3=%error
95	10	±.5	.005

speaker

In 95, LG is worth 10mil +/- .5mil with an

% error of .005%

According to — regression

Y_1 = regression

X	Y	Error	% error
1995	Worth y	± Error dy	.005

$f'(1995) \cdot dx$

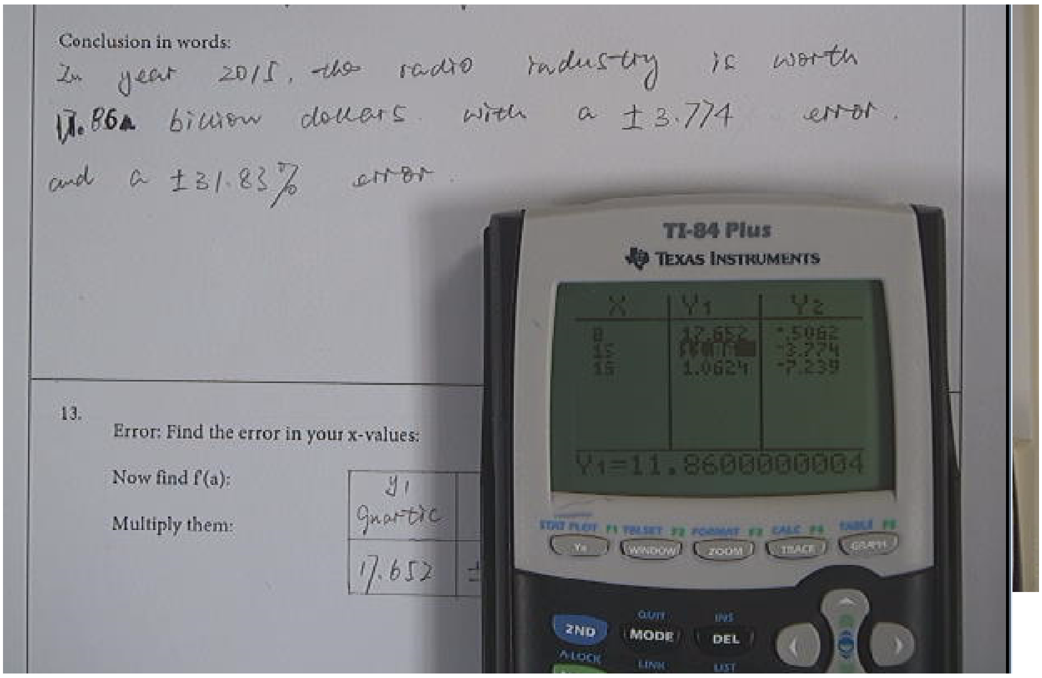
Y_2 = nDeriv$(Y_1, X, X) \cdot .5$

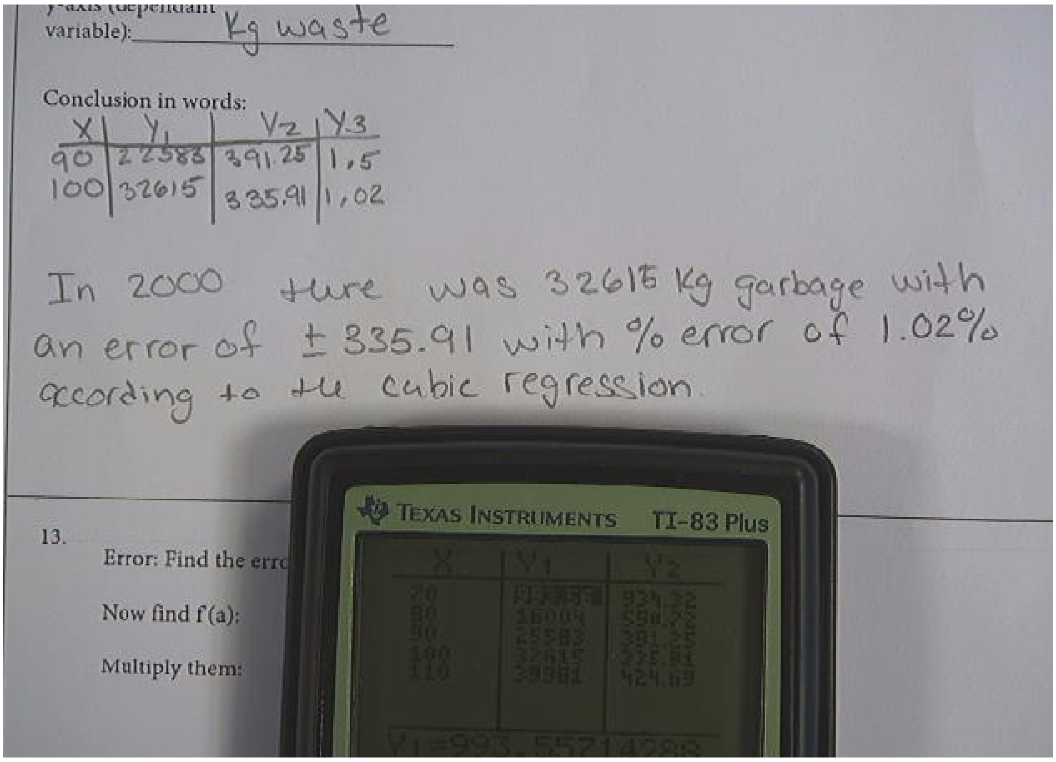
$Y_3 = Y_2 / Y_1 \times 100$ = % error

In 95, LG is worth 10mil +/- .5mil with an error of .005%

nclusion in words:

With 50k cases there are 1181.3 earthquakes plus and minus 117 with an error of 10%.


Conclusion in words:
In year 2015, the radio industry is worth 11.86 billion dollars with a ± 3.774 error. and a ± 31.83% error.
TI-84 Plus
TEXAS INSTRUMENTS
X | Y1 | Y2
0 | 17.652 | -.5062
15 | | -3.774
15 | 1.0624 | -7.239
Y1=11.8600000004
13.
Error: Find the error in your x-values:
Now find f'(a):
Multiply them:
y1
quartic
17.652
2ND
MODE
DEL



y-axis (dependant variable): Kg waste

Conclusion in words:

X	Y_1	Y_2	Y_3
90	22583	391.25	1,5
100	32615	335.91	1,02

In 2000 there was 32615 Kg garbage with an error of ± 335.91 with % error of 1.02% according to the cubic regression.

13.

Error: Find the erro

Now find f'(a):

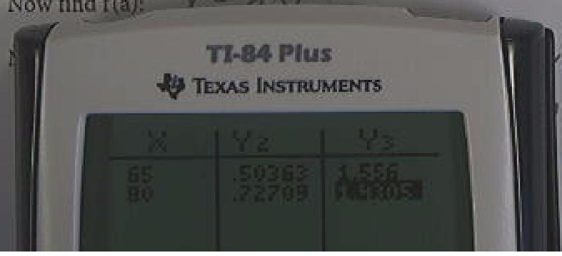
Multiply them:

lusion in words:

At 80 mil spent they will win 51 games with an error of ± 1 game with a percent error of 1.5.

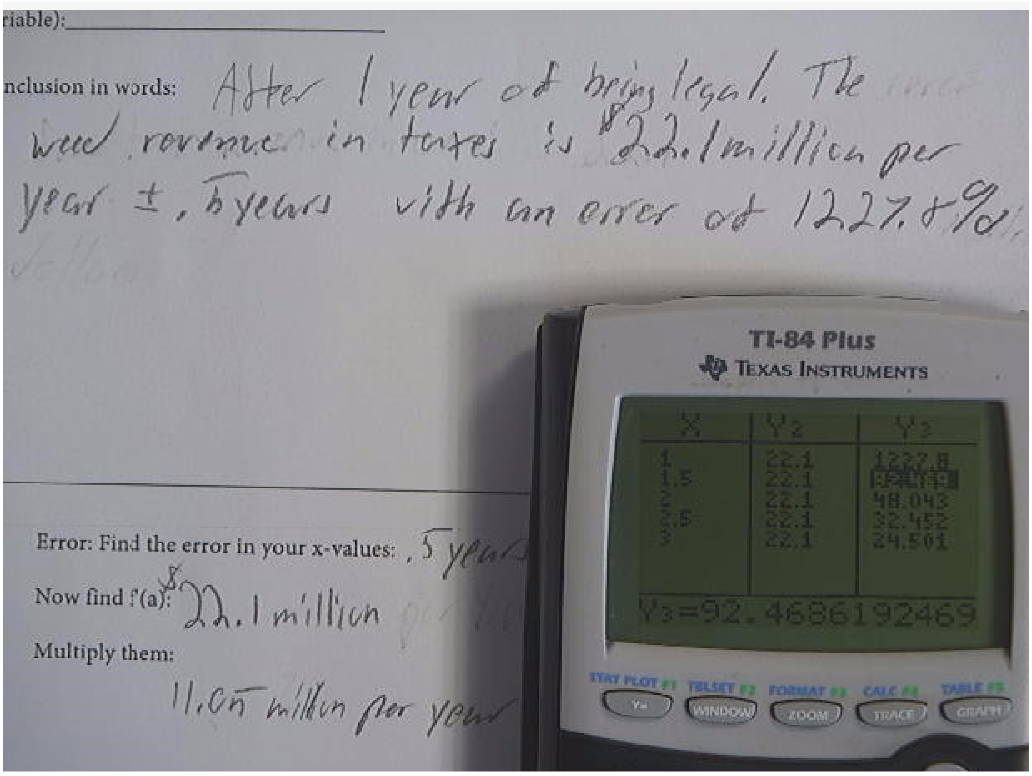
Error: Find the error in your x-values: $\Delta x = .5$

Now find f(a): $Y = f(\ldots$



$Y_1, x, X) \cdot .5 = .712$

$Y_1 \times 100 = 1.5$



riable):________________

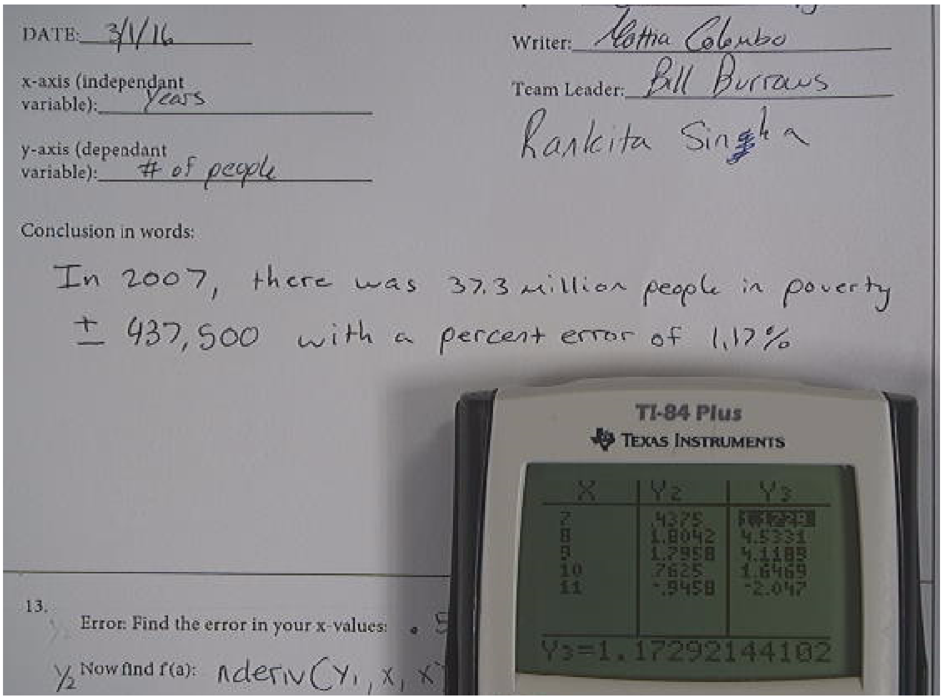
nclusion in words: After 1 year of being legal. The weed revenue in taxes is $22.1 million per year ± .5 years with an error of 1227.8%

Error: Find the error in your x-values: .5 years

Now find f'(a): $22.1 million

Multiply them:

11.05 million per year



DATE: 3/1/16

x-axis (independant variable): Years

y-axis (dependant variable): # of people

Writer: Mattia Colombo

Team Leader: Bill Burrows

Rankita Singha

Conclusion in words:

In 2007, there was 37.3 million people in poverty ± 437,500 with a percent error of 1.17%

13.

Error: Find the error in your x-values: • 5

½ Now find f'(a): nderiv(Y₁, x, x

Group Name: Team Xiao

DATE: 3/1/16

x-axis (independant variable): years   dx = 0.5 yer

y-axis (dependant variable): people

Speaker:

Writer: Mariam Shah

Team Leader: Yvette

Conclusion in words:

In 2016 according to the exponential regression the population of NJ will be 1.1×10^7 people with an error of ± 62344 & a percent error of 0.57%

13. Error: Find the error in your x-values: dx = 0.5 years

Now find f'(a): exponential regression

Multiply them: y = a·b^x