

What is Calculus:

Study of change of Function

3 ways : Increasing Decreasing Neutral
Slope \neq + - 0

M_{sec} = Average Rate of Change Two Points

M_{tan} = Instantaneous Rate of Change one Point

$\frac{dy}{dx}$ derivative deriv (y, x, x)

$f'(x)$ $\leftarrow \frac{d}{dx} [y]$ a function

$f'(a)$ \leftarrow at a point "a"

Limits $\lim_{x \rightarrow a} f(x)$

① Try plug a into $f(x)$
 $= f(a)$

② $\frac{0}{0}$, try to factor + simplify
then plug in a

③ Look at graph or
Table in calculator

Definition of Derivative

$$\lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h} = f'(a)$$

Ex $f(x) = x^2 + 5$

$$f(a+h) = (a+h)^2 + 5$$

$$= a^2 + 2ah + h^2 + 5$$

$$f(a) = a^2 + 5$$

$$f(a+h) - f(a) = 2ah + h^2$$

$$\frac{f(a+h) - f(a)}{h} = \frac{2ah + h^2}{h} = 2a + h$$

$$\lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h} = \lim_{h \rightarrow 0} 2a + h = 2a$$

Rules for Derivatives

$$\frac{d}{dx} \text{ Constant} = 0$$

$$\frac{d}{dx} x = 1$$

$$\frac{d}{dx} m \cdot x = m$$

$$\frac{d}{dx} mx + b = m$$

$$\frac{d}{dx} (f + g) = f' + g'$$

Power Rule

$$\frac{d}{dx} x^n = n \cdot x^{n-1}$$

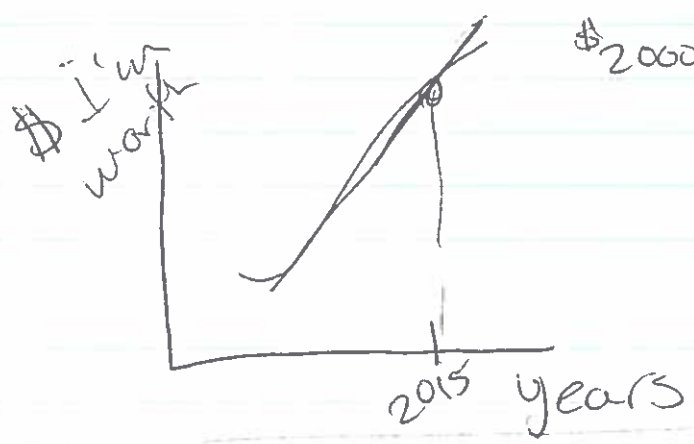
Ex $\frac{d}{dx} x^2 = 2x^1$

Ex $\frac{d}{dx} (x^3 - 2x^2 + 7x - 5)$
 $= 3x^2 - 2 \cdot 2x^1 + 7 + 0$

Multiplicate by constant

$$\frac{d}{dx} mf = m \cdot \frac{df}{dx}$$

$$= 3x^2 - 4x + 7$$



In 2015, my net worth is growing by 2000 \$/yr

2017 Brick Squad

Cynthia

(4)

Ages	people (per 100,000) who have breast cancer
50	200
60	300
70	400
80	450
90	400

X	$\frac{1}{n}$	$\frac{1}{2}$	$\frac{1}{3}$
60	300	10.833	10.833

The age of 60, 10,833 people per years of age are getting cancer.

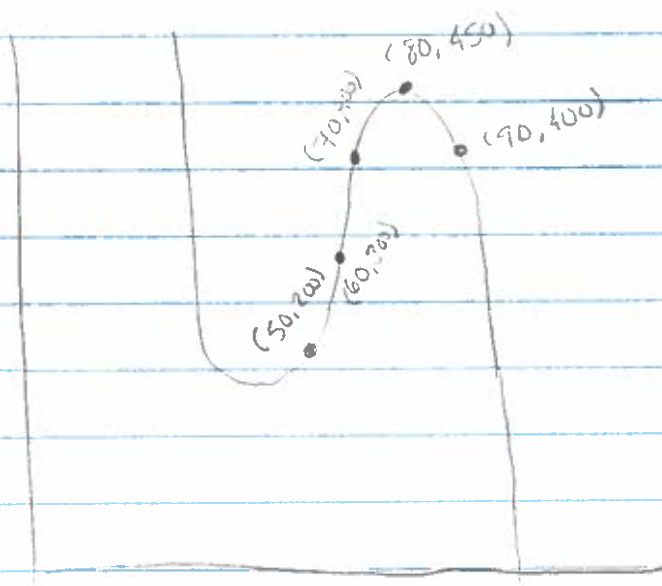
Windows

$$x_{\min} = -10$$

$$x_{\max} = 150$$

$$y_{\min} = -1$$

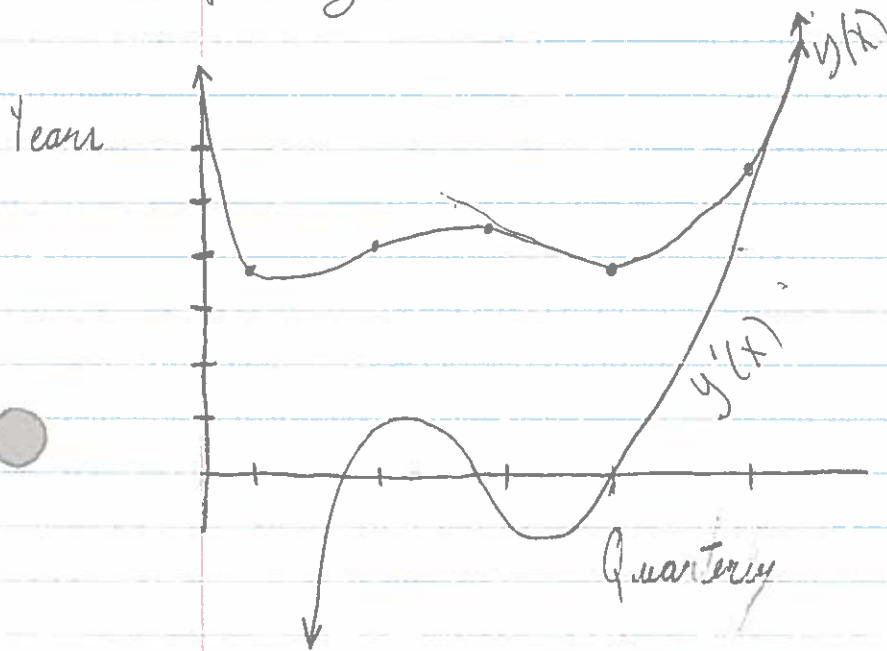
$$y_{\max} = 500$$



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The Wolves on Wall Street

When we reach our 3rd Quarter, our stock will be decreasing by 4.808 million per year



Christian Fajardo
Kearie Reyes
Dylan Keedy

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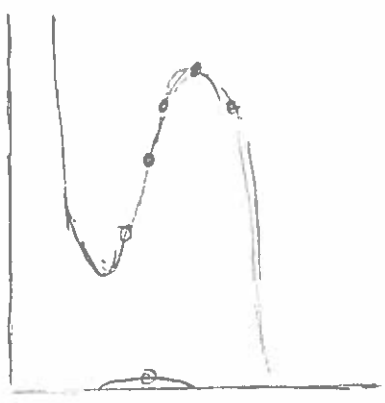
1017 Brick Squad

leader
Abah

Team B
Mark
Vojish

Team A
Adan
Cynthia

Around the age of 80 the rate of breast cancer
rises 0, and then begins to go down.

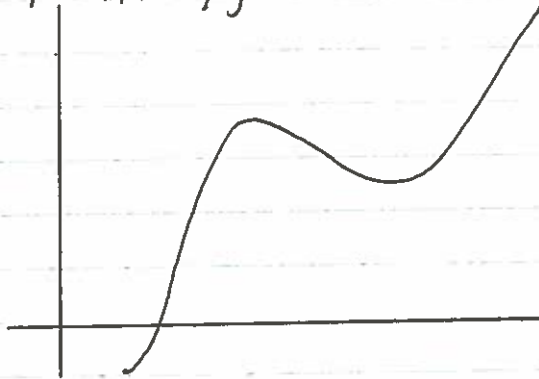


x	Y_2	Y_3
79	1.8083	1.8083
80	.83333	.83333
81	-.1917	-.1917
82	-1.267	-1.267
83	-2.392	-2.392

App downloads

X	y_1	y_2
10	1	-25.4
11	3	14.733
11.5	10	12.2
12	15	8.4667
12.5	20	13.933

In the year 2011, app downloads is growing by 14.733 billion/year.



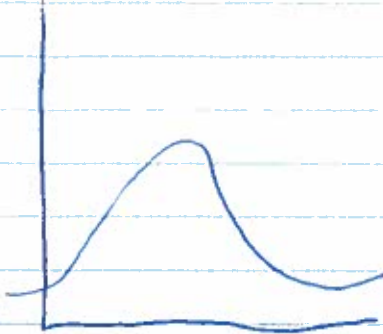
Mathletes

- 1) Kris Gardner
- 2) Angelica Ippolito

Fin

2/10/15

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* ~~Between the 1st year of starting and the 4th year of working as an~~ ^{In the} FBI agent, one can expect an increase of \$5,369.60 per year.