

rat with an e

Elizabeth and Zeke

@RealityMinus3

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Hello, tribe!



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Consider $y = 2^x$ and its tangent line which goes through $(0, 0)$. What are the coordinates of the point of tangency? How about for $y = 3^x$?

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Intersection

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"What is the point of intersection". Ooh. That's pretty judgmental. :-/



1



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"Point of _____"

#mathsgrammarpolice

20% Tangence

46% Tangency

8% Tangentiation

26% Tangentialnesslikeinnit

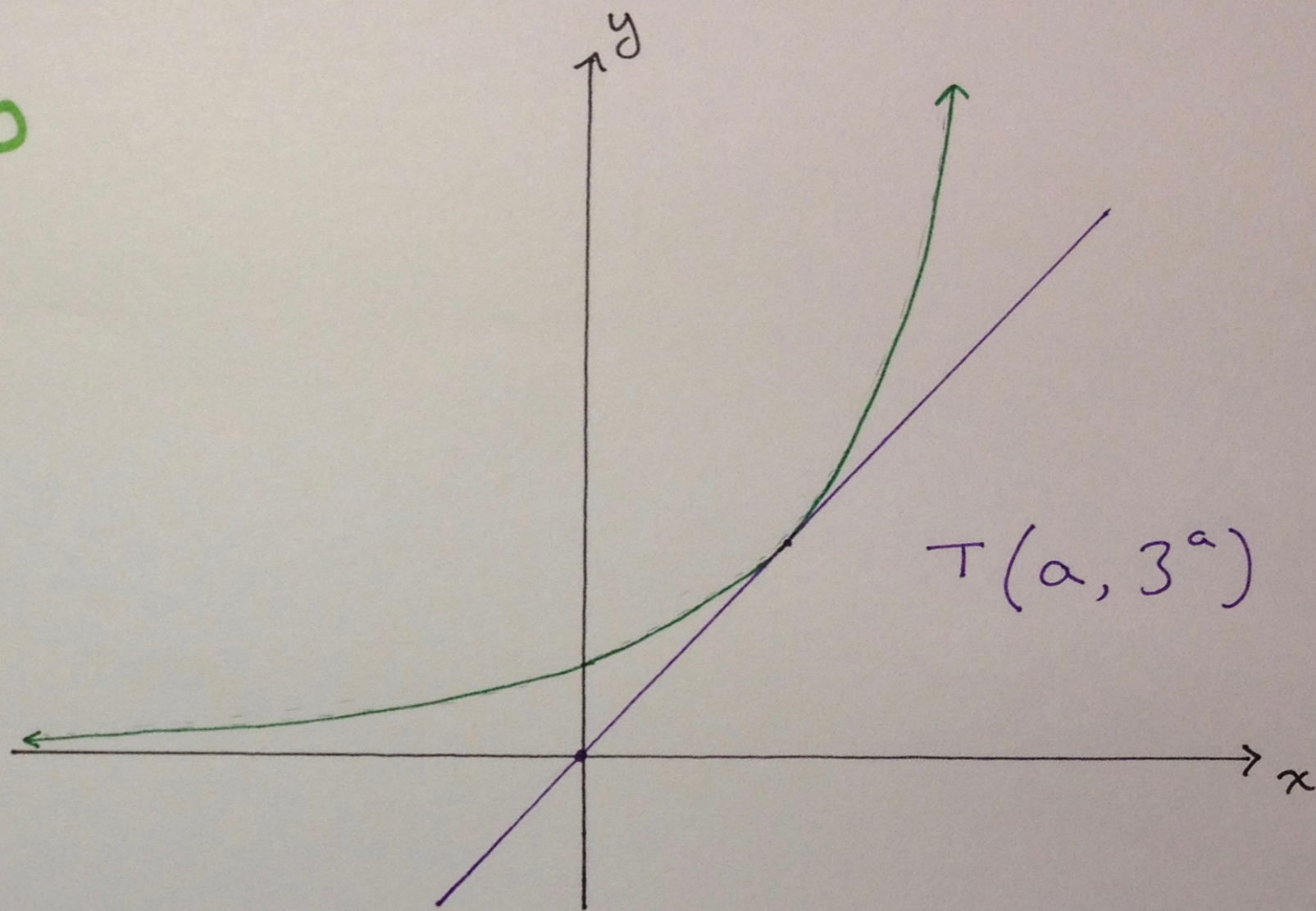
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8:48 pm - 24 Oct 2017

$$y = b^x, \quad b > 0$$

$$y = 3^x$$



tangent line
through $(0, 0)$?

$$y = 3^x$$

$$y' = (\ln 3) 3^x$$

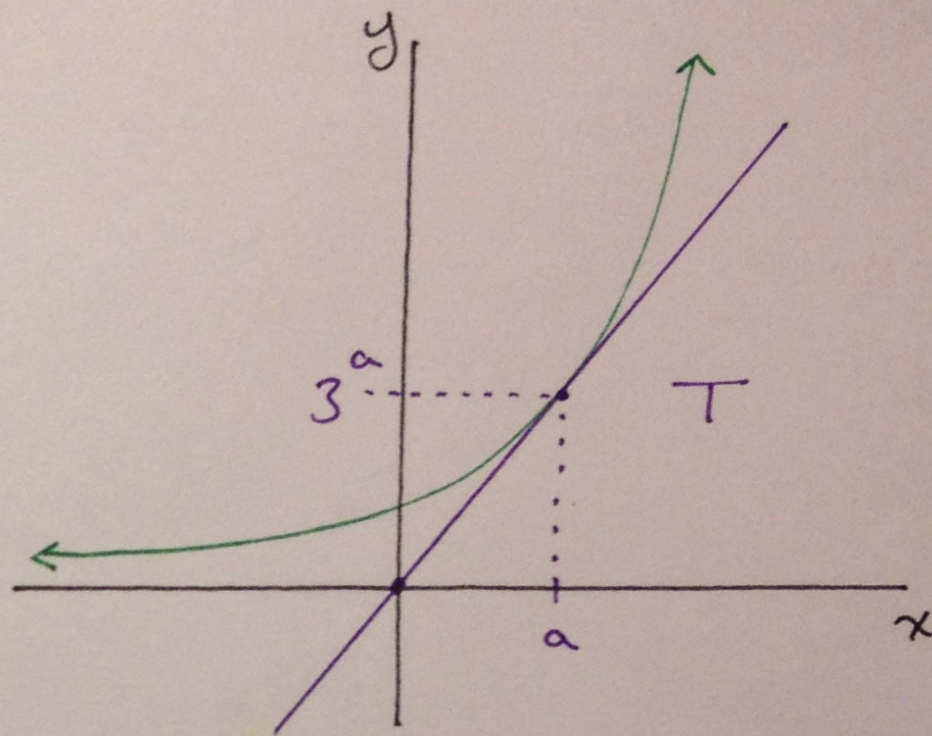
$$\text{Also: } \frac{\Delta y}{\Delta x} = \frac{3^a - 0}{a - 0} = \frac{3^a}{a}$$

Equate:

$$(\ln 3) 3^a = \frac{3^a}{a}$$

$$a = \frac{1}{\ln 3}$$

$$T: \left(\frac{1}{\ln 3}, 3^{\frac{1}{\ln 3}} \right)$$



$$3^{\frac{1}{\ln 3}} = \text{thing}$$

me

$$\ln\left(3^{\frac{1}{\ln 3}}\right) = \ln(\text{thing})$$

$$\frac{1}{\ln 3} \ln 3 = \ln(\text{thing})$$

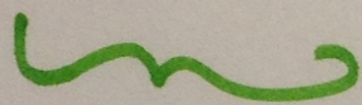
$$1 = \ln(\text{thing})$$

$$e = \text{thing}$$

$$\therefore 3^{\frac{1}{\ln 3}} = e$$

∴

$$3^{\frac{1}{\ln 3}} = \text{thing}$$



must be e , because

$$e^{\ln 3} = 3$$

we're taking the " $\ln 3$ "th root

$$b^{\log_b \#} = \#$$

!!!! 'wow! =