

Who Killed Bhavani Manjula?--A Story of Microfinance in Andhra Pradesh (B)

The murderer is... **SERGEANT FOUST**

WHAT TIME DID DR. DEDMAN DIE?

In order to approximate the time of Dr. Dedman's death, we have to create an equation modeling the rate at which his body is cooling.

$$y = ab^x + k$$

We can plug in our two points, (0, 27) and (1, 24), in order to solve for the a and b values of the equation. Our k value will be 17, as the asymptote of the graph, as determined earlier, is 17.

$$27 = ab^0 + 17 \quad 24 = ab^1 + 17$$

$$10 = ab^0 \quad 7 = ab^1$$

$$10 = a(1) \quad 0.7 = a$$

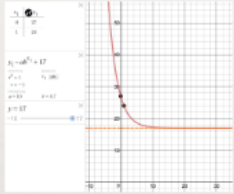
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WHAT TIME DID DR. DEDMAN DIE?

This is further confirmed by using the exponential regression feature on a graphing calculator.



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$$2 = 0.7^x$$

$$\log_7 2 = -1.04$$

Thus, Dr. Dedman was killed 1.04 hours, or 1 hour and 56.4 minutes before 5:05pm.

Loading the time of Dr. Dedman's murder to be approximately...
3:09 PM

WHO KILLED DR. DEDMAN?



After finding that Dr. Dedman died at approximately 2:59 pm, we went to the check-in register to find out the location. After looking at the sign in front, there appeared to be no one that had signed into or out of the office around 2:00 pm. Making sure everyone signed their signed outside of the office between 2:51 pm, and 2:59 pm, we approximately the time of the murder, points to Sergeant Foust's direction as the murderer.

DR. DEDMAN

When Agent 008 checked the the doctor's body temperature, Dr. Dedman had a body temperature of 27°C. At exactly 1 hour later, Agent 008 checked the thermometer again and saw Dr. Dedman's body temperature had fallen to 24°C.

Thus, with these two pieces of information, we are able to create two points (in terms of hours):

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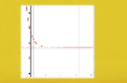
FOUST'S ARREST

However, we couldn't be sure. Why would Foust want to kill Dr. Dedman? Well, after looking back at Agent 008's thoughts, he remembered in "Foust thought for a moment the thought of how doing Foust's job he would get a little bit crazy sitting behind a desk most of the day."

This further points to Sergeant Foust being the murderer. Then we thought back to when Agent 008 returned. Foust said that he spoke to Dr. Dedman one hour ago even though Dr. Dedman was killed about two hours ago. That further confirmed that Sergeant Foust was the infamous "Madman", as he made up false information just to cover himself up as the murderer.


IS THERE AN ASYMPTOTE?

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WHAT TIME OF PUNISHMENT TO SERVE?

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WHAT TIME OF PUNISHMENT TO SERVE?

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WHAT WERE THE EVIDENCES?

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DR. DEDMAN

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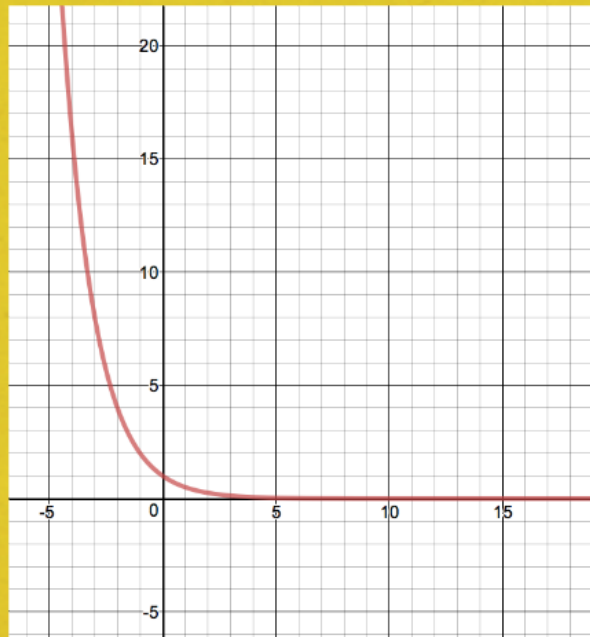
	$(0, 27)$
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WHAT TYPE OF FUNCTION IS THIS?

We can determine that this function will be an exponential decay function, as Newton's Law of Cooling is in exponential decay form, and we are trying to determine a function for Dr. Dedman's cooling body.

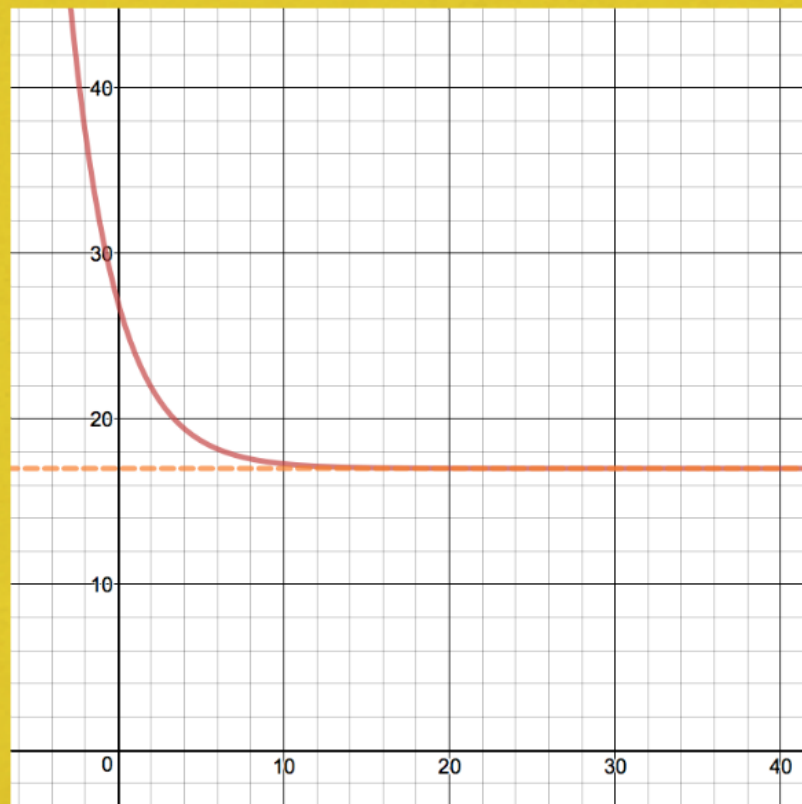
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We can also determine that this function will have an asymptote at $y=17$, as the room temperature is 17°C , and Dr. Dedman's body temperature cannot go any lower than room temperature.



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$$\begin{aligned} 27 &= ab^0 + 17 \\ 10 &= ab^0 \\ 10 &= a(1) \\ 10 &= a \end{aligned}$$

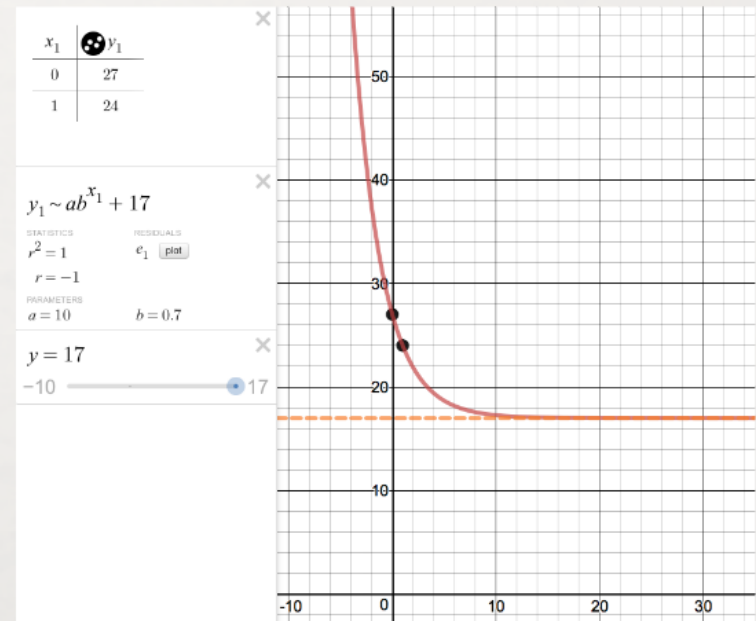
$$\begin{aligned} 24 &= ab^1 + 17 \\ 7 &= ab^1 \\ 7 &= 10b^1 \\ 0.7 &= b \end{aligned}$$

$$y = 10(0.7)^x + 17$$

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$$0.7 = b$$

$$y = 10(0.7)^x + 17$$

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x_1	y_1
0	27
1	24

$$y_1 \sim ab^{x_1} + 17$$

STATISTICS

$$r^2 = 1$$

$$r = -1$$

PARAMETERS

$$a = 10$$

$$b = 0.7$$

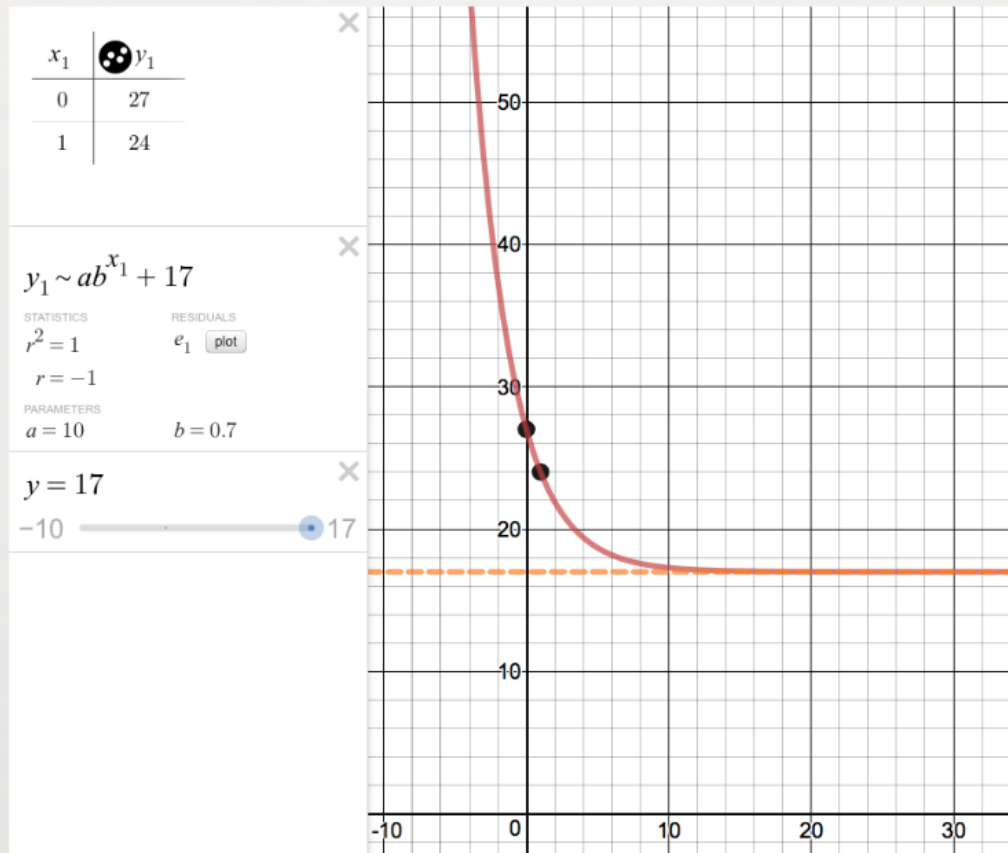
$$y = 17$$

-10

The

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$$2 = 0.7^x$$

$$\log_{0.7} 2 = -1.94$$

Thus, Dr. Dedman was killed 1.94 hours, or 1 hour and 56.4 minutes before 5:05pm.

Leading the time of Dr. Deadman's murder to be approximately...

3:09 PM

WHO KILLED DR. DEDMAN?

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Coroner's Office - Please Sign In		
Name	Time In	Time Out
Lt. Borman	12:08	2:47
Alice Bingham	12:22	1:38
Chuck Miranda	12:30	2:45
Harold Ford	12:51	1:25
Ajax Boraxo	1:00	2:30
D.C. Quincy	1:10	2:45
Agent 008	1:30	1:50
Ronda Ripley	1:43	2:10
Jeff Dangerfield	2:08	2:48
Stacy Simmons	2:14	2:48
Brock Ortiz	2:20	2:51
Pierce Bronson	3:48	4:18
Max Sharp	3:52	5:00
Maren Ezaki	3:57	4:45
Caroline Cress	4:08	4:23
Milly Osborne	4:17	4:39
D.C. Quincy	4:26	4:50
Vinney Gumbatz	4:35	4:57
Cory Delphene	4:48	
Max Crutchfield	5:04	
Agent 008	5:05	
Security	5:12	

After finding that Dr. Dedman died at approximately 3:09 p.m., we went to the check-in register to find our murderer. After looking at the sign-in sheet, there seemed to be no one that had signed into or out of the office around 3:09 p.m. Making sure everyone signed into and out of the office between 2:51 p.m. and 3:48 p.m., have signed into/out of the time of the murder, points in Sergeant Foust's direction as the murderer.