Nitasha Paul What's that Graph?

1st graph The distance a car travels (D) is plotted against time (T). This is for the case of a car after the acceleration pedal has been pushed.

* I found that this is the same as Gwen's so I thought of another process: Years of life (Y) against age (A)

2nd graph Here we plot the temprature of a hot drink (C) against time (T)

3rd graph Here we plot the volume taken up by paintbrushes of the same geometry against no. of paintbrushes (N).

4th graph Here I bounce a ball with the same speed. I plot the height of the ball (H) against time (T)

5th graph We plot distance against time (T). t=0 corresponds to the time the car starts.

6th graph Here we have a cup of juice and suck from it at a constant rate. We plot volume of juice (V) against time (T). *

7th graph I throw a ball and catch it. Then we plot height of ball (H) against time (T)

8th graph Here we plot height of a girl after the age of 14 against time.

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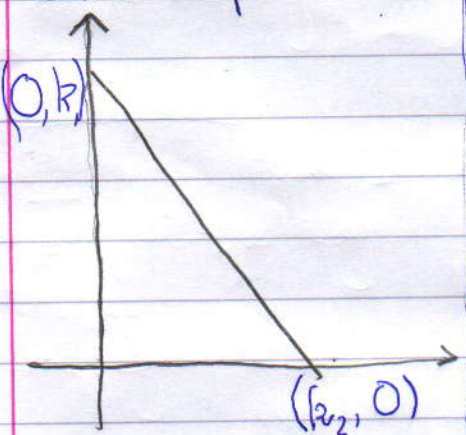
Graph No.	Process No.	Equation No.
1st	7th	??
2nd	1st	4th
3rd	4th	7th
4th	2nd	?
5th	5th	5th
6th	8th	8th / 3rd
7th	3rd	6th
8th	6th	8th / 3rd

Linear Graphs:



$y = Ax + B \quad B = k_1$

or $y = Ax + k_1$

When $y = 0$ then

$0 = Ax + k_1$

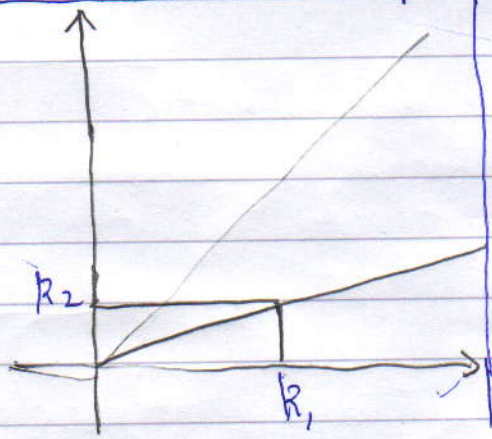
or $k_1 = -Ax$

or $-A = \frac{k_1}{x}$

or $A = \frac{-k_1}{x}$

$A < 0$

$B > 0$



$y = Ax$

When $y = k_2$

then $k_2 = k_1 A$

or $A = k_2 \div k_1$

$A > 0$

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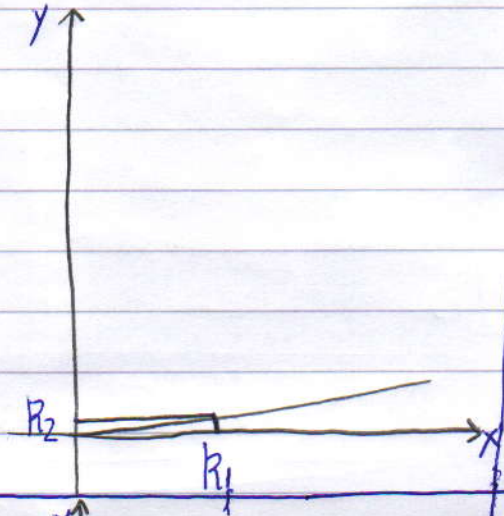


$y = Ax + B \quad B = 0$

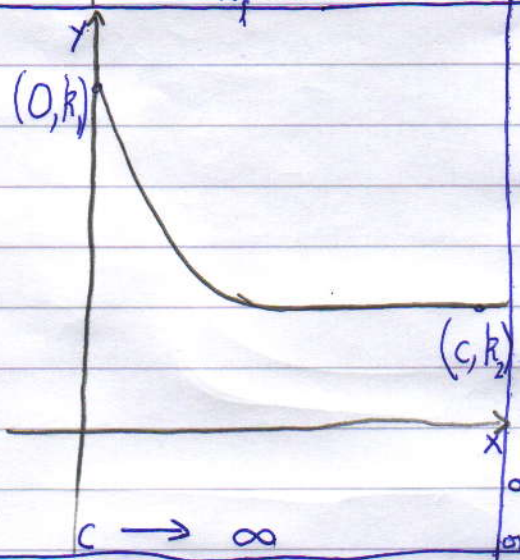
or $y = Ax$

when $x = k_1, y = k_2$

or $k_2 = Ak_1$

or $A = \frac{k_2}{k_1}$

$A > 0$



$y = \frac{A}{e^x} + B$

when $x = c \quad y = k_2$

or $k_2 = \frac{A}{e^c} + B$

or $k_2 = B$

When $x = 0 \quad y = k_1$

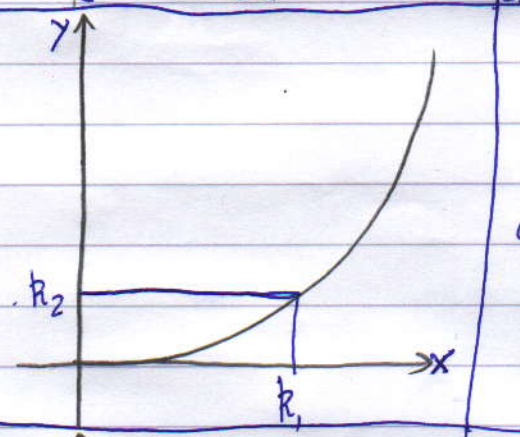
or $k_1 = A + k_2$

or $A = k_1 - k_2$

$B > 0$

~~$A < 0$~~

$A > 0$



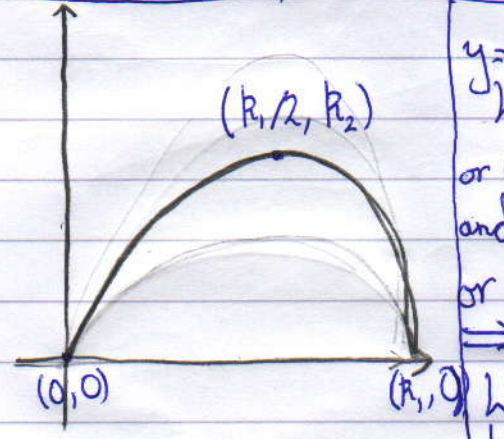
$y = Ax^2$

When $y = k_2 \quad x = k_1$

$k_2 = Ak_1^2$

or $A = \frac{k_2}{k_1^2}$

$A > 0$



$y = Ax^2 + Bx + C$

When $x = 0 \quad y = 0$

or $0 = C$

and $0 = Ak_1^2 + Bk_1$

or $0 = k_1(Ak_1 + B)$

$\Rightarrow B = -Ak_1$

When $x = k_1/2$

$k_2 = \frac{A}{4}k_1^2 - \frac{Ak_1k_2}{2}$

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$$\text{or } k_2 = A\left[\frac{k_1^2}{4} - \frac{k_1 k_2}{2}\right]$$

$$\text{or } k_2 = A\left(\frac{k_1}{2}\right)\left[\frac{k_1}{2} - k_2\right]$$

$$\text{or } A = \frac{k_2}{\left(\frac{k_1}{2}\right)\left(\frac{k_1}{2} - k_2\right)} = \frac{-B}{k_1}$$

$$\text{or } -B = \frac{k_2 k_1}{\left(\frac{k_1}{2}\right)\left(\frac{k_1}{2} - k_2\right)}$$

$$B = -\frac{k_2 k_1}{\left(\frac{k_1}{2}\right)\left(\frac{k_1}{2} - k_2\right)}$$