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CLASS : HYDROLOGY ENGINEERING A

1. Here is the rain observation data:

Birthday Period (T)	5	10	25	50	100
Rain (mm)	101.00	131.80	150.16	170.80	191.00

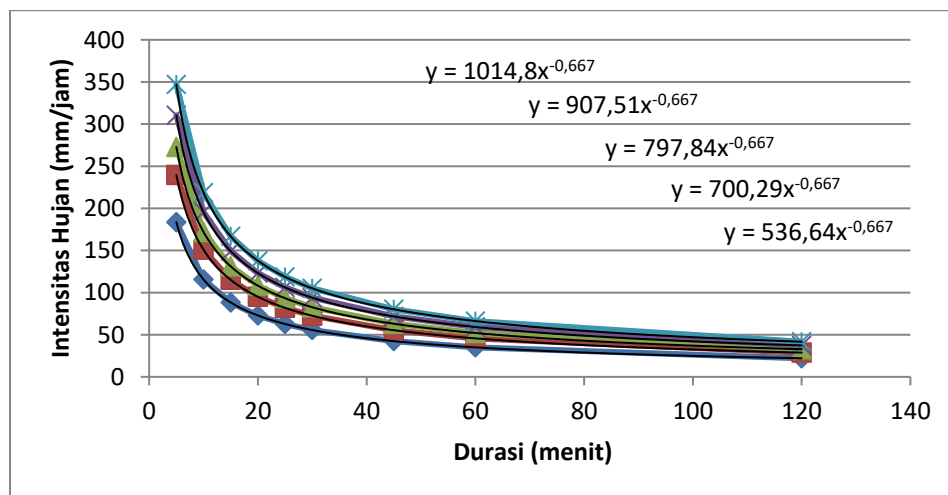
Create an IDF curve and determine its curve equation for each repeat period

ANSWER

Count result

Curah Hujan	Periode Ulang t	Durasi (menit)									
		5	10	15	20	25	30	45	60	120	
101,00	5	183,5292	115,6161	88,23163	72,8336	62,7660966	55,58244	42,41734	35,01474	22,05791	
131,80	10	239,4965	150,8733	115,1379	95,04425	81,9066489	72,53234	55,35253	45,69251	28,78448	
150,16	25	272,8588	171,8903	131,1768	108,2841	93,3164066	82,63623	63,06325	52,05756	32,79421	
170,80	50	310,3642	195,5172	149,2075	123,1681	106,143062	93,99486	71,73151	59,21305	37,30189	
191,00	100	347,07	218,6404	166,8539	137,7348	118,696282	105,1114	80,21497	66,216	41,71347	

❖ IDF Curve Curve Result(Frequency Duration Intensity)



❖ IDF curve equation(Intensity of frequency duration) of each repeat period

- 5-year birthday period: $y = 536.6x^{-0.66}$
- 10-year birthday period: $y = 700.2x^{-0.66}$
- 25-year birthday period: $y = 797.8x^{-0.66}$
- 50-year reset period: $y = 907.5x^{-0.66}$
- 100-year reset period: $y = 1014.x^{-0.66}$

2. Calculate the values from 1984-1986 for station D from the following data:

Settlement

- Slope 1984-1986

$$\text{Slope 1} = \frac{322-0}{933-0} = 0.3429$$
- Slope 1977-1983

$$\text{Slope 2} = \frac{205-322}{621-939} = 0.3679$$
- So that the rains in 1984-1986 can be calculated:

$$h1 = () \times H1 = 0.9320 \frac{0.342918}{0.367924528}$$

Count Results

Year	Annual CH (in) for stations				Total A+B+C	Cumulative CH (in)		H1
	A	B	C	D		A+B+C	D	
1977	30	31	27	29	88	88	29	
1978	33	36	32	32	101	189	61	
1979	26	27	24	28	77	266	89	
1980	27	26	27	29	80	346	118	
1981	34	34	30	30	98	444	148	
1982	31	33	31	29	95	539	177	
1983	28	30	24	28	82	621	205	
1984	35	34	33	39	102	723	244	227.416
1985	37	39	36	41	112	835	285	265.629
1986	34	35	35	37	104	939	322	300.114