Calculate TF-IDF For (d_1, t_3) & (d_6, t_7)

	t_1	t_2	t_3	t_4	t_5	t_6	t_7
d_1	0	40	5	9	1	0	0
d_2	0	0	10	11	12	0	0
d_3	1	2	3	29	0	0	1
d_4	20	12	11	10	9	5	1
d_5	12	10	22	43	9	12	10
d_6	10	10	100	100	10	10	1

Formulae For TF & IDF.

$$T.F(d,t) = \begin{cases} 0 & \text{if } Freq(d,t) = 0 \\ 1 + \log(1 + \log(Freq(d,t))) & \text{otherwise} \end{cases}$$

$$IDF(t) = \log\left(\frac{1+d}{d_t}\right)$$

d = document collection
d_t = set of documents containing term t.

$$TF\text{-}IDF(d,t) = TF(d,t) \times IDF(t)$$

① $TF(d_1, t_3) = 1 + \log(1 + \log 5) = 1.230$

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② $IDF(t_3) = \log\left(\frac{1+6}{6}\right) = 0.066$

③ $TF(d_6, t_7) = 1 + \log(1 + \log 1) = 1$

④ $IDF(t_7) = \log\left(\frac{1+6}{4}\right) = 0.243$

- $TF\text{-}IDF(d_1, t_3) = 1.230 \times 0.066 = 0.08118$

- $TF\text{-}IDF(d_6, t_7) = 1 \times 0.243 = 0.243$