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Q/- Calculating Dependent Samples t-test.

T_1	T_4	$T_4 - T_1 (D)$	D^2
27	35	8	64
19	13	-6	36
28	34	6	36
3	8	5	25
12	3	-9	81
19	25	6	36
37	41	4	16
18	24	6	36
47	57	10	100
32	36	4	16
		$\Sigma D = 34$	$\Sigma D^2 = 446$
$N = 10$			

Formula:

$$t = \frac{|M_1 - M_2|}{SEDM}$$

Step 1: Calculate $(T_4 - T_1)$ or 'D' to obtain ΣD.

Step 2: Calculate D^2 to obtain ΣD^2

Step 3: Calculate Σd^2 using the formula: $\Sigma D^2 - \frac{(\Sigma D)^2}{N}$

$$= 446 - \frac{(34)^2}{10}$$

$$= 446 - \frac{1156}{10} \Rightarrow 446 - 115.6$$

$$\underline{\underline{\Sigma d^2}} = 330.4$$

Step 4: Calculate Standard Deviation (S.D), using the formula:

$$\sqrt{\frac{\Sigma d^2}{N}}$$

$$= \sqrt{\frac{330.4}{10}} = \sqrt{33.04}$$

$$S.D(\sigma) = 5.75$$

Step 5: Calculate Standard Error of Mean difference {SE_{DM}}, using the formula:

$$\frac{\sigma}{\sqrt{N-1}}$$

$$= \frac{5.75}{\sqrt{10-1}} = \frac{5.75}{3} = 1.92$$

$$SE_{DM} = 1.92$$

Step 6: Calculate $|M_1 - M_2|$ by using the formula: $\frac{\Sigma D}{N}$

$$= \frac{34}{10} = 3.4$$

Step 7: Put all the values in the formula:

$$t = \frac{|m_1 - m_2|}{SE_{DM}} = \frac{3.4}{1.92}$$

$$t = 1.77$$