

## Certain Easy Squaring and Multiplication

(Every one knows except one or two.)

### Type I :

$$15^2 = (1^2 + 1), 5^2 = 225 \quad (\text{or}) \quad (1 + 1)1, 5^2 = 225$$

$$25^2 = (2^2 + 2), 5^2 = 625 \quad (\text{or}) \quad (2 + 1)2, 5^2 = 625$$

$$35^2 = (3^2 + 3), 5^2 = 1225 \quad (\text{or}) \quad (3 + 1)3, 5^2 = 1225$$

Similarly..... (for examples)

$$105^2 = (10^2 + 10), 5^2 = 11025 \quad (\text{or}) \quad (10 + 1)10, 5^2 = 11025$$

$$145^2 = (14^2 + 14), 5^2 = 21025 \quad (\text{or}) \quad (14 + 1)14, 5^2 = 21025$$

$$195^2 = (19^2 + 19), 5^2 = 38025 \quad (\text{or}) \quad (19 + 1)19, 5^2 = 38025$$

$$355^2 = (35^2 + 35), 5^2 = 126025 \quad (\text{or}) \quad (35 + 1)35, 5^2 = 126025$$

(According to the feasibility and our mind multiplication we can use either the left or the right. Sometimes left side may be easy and sometimes right side may be easy.)

### Type II : To find the Unknowns' squares from the known one.

$$16^2 = 15^2 + (15 + 16) = 225 + 31 = 256$$

$$14^2 = 15^2 - (15 + 14) = 225 - 29 = 196$$

$$46^2 = 45^2 + (45 + 46) = 2025 + 91 = 2116$$

$$84^2 = 85^2 - (85 + 84) = 7225 - 169 = 7056$$

$$201^2 = 200^2 + (200 + 201) = 40000 + 401 = 40401$$

$$199^2 = 200^2 - (200 + 199) = 40000 - 399 = 39601$$

And so on ... we can find.

### Type III : Multiplication (Sum of the unit digits is 10, the remaining digits are same. It is just like Type I but with multiplication of unit digits separately.)

$$14 \times 16 = (1^2 + 1), 4 \times 6 = 224 \quad \text{or} \quad (1 + 1)1, 4 \times 6 = 224$$

$$63 \times 67 = (6^2 + 6), 3 \times 7 = 4221 \quad \text{or} \quad (6 + 1)6, 3 \times 7 = 4221$$

$$91 \times 99 = (9^2 + 9), 1 \times 9 = 9009 \quad \text{or} \quad (9 + 1)9, 1 \times 9 = 9009$$

$$132 \times 138 = (13^2 + 13), 2 \times 8 = 18216 \quad \text{or} \quad (13 + 1)13, 2 \times 8 = 18216$$

$$401 \times 409 = (40^2 + 40), 1 \times 9 = 164009 \quad \text{or} \quad (40 + 1)40, 1 \times 9 = 164009$$

**Note :** In this, the multiplication of unit digits must be always two digit. If it is one during the multiplication, put a 0 (zero) on it's left. (See  $91 \times 99$  in the example.)

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# 10 கணிதம் - 4ள்ளியியல்

வாங்குதலைம் காண உதவும் சூத்திரம்..

- Very useful
- Simple
- Accurate.

$$\sqrt{x \pm y} = \sqrt{x} \pm \frac{y}{2\sqrt{x}}$$

THANKS TO...  
MR. SREEDHARAN,  
Kancheepuram.

① எடுத்துக்காட்டு - 8.4:

$$\sqrt{8} = \sqrt{9-1}$$

$$\sqrt{x-y} = \sqrt{x} - \frac{y}{2\sqrt{x}}$$

$$x=9, y=1 \Rightarrow \sqrt{9-1} = \sqrt{9} - \frac{1}{2\sqrt{9}}$$

$$= 3 - \frac{1}{2 \times 3} = 3 - \frac{1}{6}$$

$$= 3 - 0.166 = 2.834$$

Book Answer:  $\approx 2.83$

② எ.கா. 8.5:

$$\sqrt{8.53} = \sqrt{9-0.47} = \sqrt{9} - \frac{0.47}{2\sqrt{9}}$$

$$= 3 - \frac{0.47}{6}$$

$$= 3 - 0.078 = 2.92$$

Book  $\approx 2.9$

③ எ.கா. 8.6:

$$\sqrt{44.49} = \sqrt{49-4.51} = 7 - \frac{4.51}{2 \times 7}$$

$$= 7 - 0.32 = 6.68$$

Book  $\approx 6.67$

④ எ.கா. 8.7

$$\sqrt{5.5-0.25} = \sqrt{5.25} = \sqrt{4+1.25}$$

$$= 2 + \frac{1.25}{2 \times 2} = 2 + 0.31$$

$$\approx 2.31$$

Book  $\approx 2.29$

⑤ எ.கா. 8.8:

$$\sqrt{6} = \sqrt{4+2}$$

$$= 2 + \frac{2}{2 \times 2} = 2.5$$

Book  $\approx 2.45$

⑥ எ.கா. 8.9:

$$\sqrt{5.2} = \sqrt{4+1.2} = 2 + \frac{1.2}{2 \times 2}$$

$$= 2 + 0.3 = 2.3$$

Book  $\approx 2.28$

⑦ எ.கா. 8.11:

$$\sqrt{2.58} = \sqrt{4-1.42} = 2 - \frac{1.42}{2 \times 2}$$

$$= 2 - 0.355$$

$$= 1.645$$

Book  $\approx 1.6$

⑧ எ.கா. 8.13:

$$\sqrt{2.779} = \sqrt{4-1.221} = 2 - \frac{1.221}{2 \times 2}$$

$$= 2 - 0.305 = 1.695$$

Book: 1.667

⑨ எ.கா. 8.14:

$$\sqrt{35} = \sqrt{36-1} = 6 - \frac{1}{2 \times 6}$$

$$= 6 - 0.083 = 5.917$$

Book  $\approx 5.9$

⑩ எ.கா. 8.17

$$\sqrt{19.43-18.40} = \sqrt{1.03} = \sqrt{1+0.03}$$

$$= 1 + \frac{0.03}{2} = 1.015$$

Book 1.01

$$\sqrt{26.29-18.40} = \sqrt{7.89} = \sqrt{9-1.11}$$

$$= 3 - \frac{1.11}{6} = 3 - 0.183$$

$$= 2.817$$

Book: 2.81

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