

# ① Estimating Square Roots.

Def: Determining the approximation

Approximate root of a number  $a$  which whole number is  $\sqrt{a}$  close

→ Now, let's get started.

Example:

1. Consider  $\sqrt{20}$ .

From the look of it, it's not proper square no. Since 20 lies

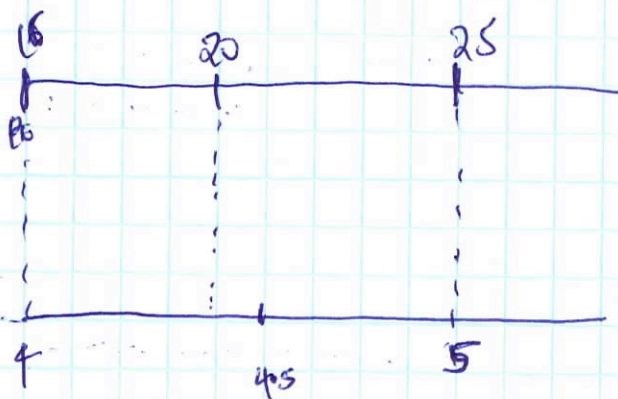
so it lies b/n 25 & 16 ~~or 5 or 4~~

Then its ~~length~~  $\sqrt{20}$  is between

5 and 4.

$$\text{That's } \sqrt{16} < \sqrt{20} < \sqrt{25}$$

we draw a diagram to ~~make~~ <sup>make</sup> get a ~~clear~~ <sup>clear</sup> sense of it.



~~$$1 \text{ square} = \frac{25-16}{9}$$~~

Let 1 sq. reps 0.1 unit

$$\sqrt{20} = 4 + (0.4) \times 4 = \underline{4.4}$$

to? How do you know?

sol:

Again, we consider two numbers b/n which  $\sqrt{96}$  lies

Thus two <sup>perfect squares</sup> whole numbers are

81 and 100. with perfect square

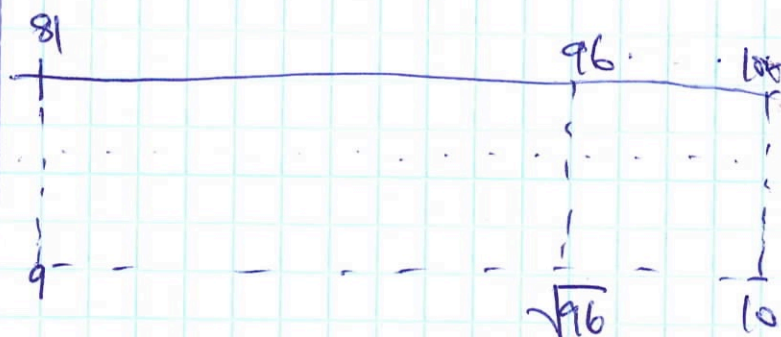
$$\therefore 81 < \sqrt{96} < 100$$

$$\text{so } \sqrt{81} < \sqrt{96} < \sqrt{100}$$



$$9 < \sqrt{96} < 10$$

draw again,



~~96 is closer to 100 than to 81~~

96 is 4 sq. unit to 100 and 19 sq. unit to 81.  $\therefore$  so,  $\sqrt{96}$  is closer to 100 or 10.

