**Warm up:**

Evaluate without a scientific calculator.

1. $7^2 = 49$
3. $1^2 = 1$
5. $7^3 = 343$
6. $\sqrt[3]{125} = 5$
2. $\sqrt{361} = 19$
4. $\sqrt{25} = 5$
6. $\sqrt[3]{729} = 9$
7. $3^3 = 27$

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Estimating Square Roots:

| | | | |
|---|---|---|---|
| $\sqrt{1} = 1$ | $\sqrt{36} = 6$ | $\sqrt{121} = 11$ | $\sqrt{256} = 16$ |
| $\sqrt{4} = 2$ | $\sqrt{49} = 7$ | $\sqrt{144} = 12$ | $\sqrt{289} = 17$ |
| $\sqrt{9} = 3$ | $\sqrt{64} = 8$ | $\sqrt{169} = 13$ | $\sqrt{324} = 18$ |
| $\sqrt{16} = 4$ | $\sqrt{81} = 9$ | $\sqrt{196} = 14$ | $\sqrt{361} = 19$ |
| $\sqrt{25} = 5$ | $\sqrt{100} = 10$ | $\sqrt{225} = 15$ | $\sqrt{400} = 20$ |

**Between which two consecutive integers is each square root?**

**Ex. 1:** $\sqrt{84}$ = 9 & 10

**Ex. 2:** $\sqrt{300}$ = 17 & 18

**Ex. 3:** $\sqrt{130}$ = 11 & 12

**Estimate each square root to the tenths place.**

**Ex. 4:** $\sqrt{84}$ ≈ 9.2

$\sqrt{81} = 9$

$\sqrt{84}$

9.1
9.2 ✱✱✱✱
9.3 ✱✱✱
9.4

$\sqrt{90}$ ~~~ 9.5

$\sqrt{100} = 10$

**Ex. 5:** $\sqrt{150}$ ≈ 12.2

$\sqrt{144} = 12$

12.1
12.2
12.3

$\sqrt{150}$

$\sqrt{156}$ ~~> 12.5✱

$\sqrt{169} = 13$

**Ex. 6:** $\sqrt{310}$ ≈ 17.6

$\sqrt{289} = 17$

$\sqrt{300}$ ~~> 17.5↓

$\sqrt{310}$

17.5
17.6
17.7

$\sqrt{324} = 18$

**Ex. 7:** $\sqrt{56}$

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**Steps for estimating a square root to the tenths place:**

① Identified the 2 #'s it's in between

② Where is half way ___.5 = $\sqrt{\phantom{00}}$

③ Decide if it is smaller than half or bigger

④ Estimate

**Compare the following roots by filling in each blank with >, <, or = to make the statement true.**

**Ex. 8:** $4.7 \_\_\_\_ \sqrt{17}$

> $4.7 > \sqrt{17}$
> $4.1$

**Ex. 9:** $-\sqrt{16} \_\_\_\_ 4^2$

> $-\sqrt{16} < 4^2$

**Ex. 10:** $\sqrt{9} \_\_\_\_ \sqrt{81}$

> $\sqrt{9} < \sqrt{81}$

**Ex. 11: Place each of the points on the number line given.**

$A = \sqrt{25}$ = 5

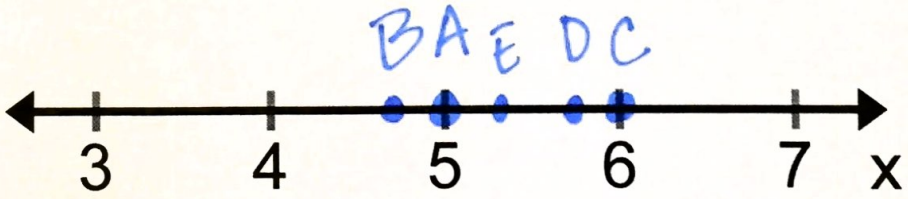
$B = 4.7$

$C = \sqrt{36}$

$D = 5.8$

$E = \sqrt{28}$

5.3



**Ex. 12: Order the set of numbers from least to greatest.**

$\sqrt{197}$, 13.5, $\sqrt{180}$, 14.7, $\sqrt{196}$, 185%

14.1 13.3 14 1.85

185%, $\sqrt{180}$, 13.5, $\sqrt{196}$, $\sqrt{197}$, 14.7