ESTIMATING SQUARE ROOTS

Name_____

★DO NOT USE A CALCULATOR FOR THIS PAPER…….it is about estimating without a calculator

PART 1 – Square each number

1^2 =
2^2 =
3^2 =
4^2 =
5^2 =
6^2 =
7^2 =
8^2 =
9^2 =
10^2 =
11^2 =
12^2 =

PART 2 – Write the square root

$\sqrt{81}$ =
$\sqrt{36}$ =
$\sqrt{144}$ =
$\sqrt{9}$ =
$\sqrt{64}$ =
$\sqrt{4}$ =
$\sqrt{100}$ =
$\sqrt{16}$ =

PART 3 – What two numbers is the square root between?

Example: $\sqrt{27}$ is between 5 and 6
(*because 27 is between 25 and 36)*

$\sqrt{50}$ is between _____ and _____

$\sqrt{72}$ is between _____ and _____

$\sqrt{10}$ is between _____ and _____

$\sqrt{139}$ is between _____ and _____

$\sqrt{19}$ is between _____ and _____

PART 4 – Which number is the square root closer to? Circle one.

Example:
Is $\sqrt{85}$ closer to (9) or **10** ?
(because 85 is closer to 81 than 100)

Is $\sqrt{20}$ closer to **4** or **5** ?

Is $\sqrt{97}$ closer to **9** or **10** ?

Is $\sqrt{125}$ closer to **11** or **12** ?

Is $\sqrt{15}$ closer to **3** or **4** ?

Is $\sqrt{40}$ closer to **6** or **7** ?

Is $\sqrt{70}$ closer to **8** or **9** ?

PART 5 - Estimate the square root to the nearest tenth.
Determine what numbers it is between & which it is closer to, then try squaring a few to see which is closest.

Example: $\sqrt{39}$ *I know it is between 6 and 7, and that it is closer to 6.*

I'll try 6.1:
6.1 x **6.1** = 6 1 / 366 / 37.21

I'll see if 6.2 is closer to 39:
6.2 x **6.2** = 124 / 372 / 38.44

It still isn't over 39, so I'll try 6.3:
6.3 x **6.3** = 189 / 378 / 39.69

this is closest to 39, so ***the answer is 6.2***

$\sqrt{72}$

$\sqrt{15}$

ESTIMATING SQUARE ROOTS

Name ANSWERS

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PART 1 – Square each number

$1^2 =$ 1
$2^2 =$ 4
$3^2 =$ 9
$4^2 =$ 16
$5^2 =$ 25
$6^2 =$ 36
$7^2 =$ 49
$8^2 =$ 64
$9^2 =$ 81
$10^2 =$ 100
$11^2 =$ 121
$12^2 =$ 144

PART 2 – Write the square root

$\sqrt{81} =$ 9
$\sqrt{36} =$ 6
$\sqrt{144} =$ 12
$\sqrt{9} =$ 3
$\sqrt{64} =$ 8
$\sqrt{4} =$ 2
$\sqrt{100} =$ 10
$\sqrt{16} =$ 4

PART 3 – What two numbers is the square root between?

Example: $\sqrt{27}$ is between 5 and 6
(because 27 is between 25 and 36)

$\sqrt{50}$ is between 7 and 8

$\sqrt{72}$ is between 8 and 9

$\sqrt{10}$ is between 3 and 4

$\sqrt{139}$ is between 11 and 12

$\sqrt{19}$ is between 4 and 5

PART 4 – Which number is the square root closer to? Circle one.

Example:
Is $\sqrt{85}$ closer to (9) or 10 ?
(because 85 is closer to 81 than 100)

Is $\sqrt{20}$ closer to (4) or 5 ?
16 25

Is $\sqrt{97}$ closer to 9 or (10) ?
81 100

Is $\sqrt{125}$ closer to (11) or 12 ?
121 144

Is $\sqrt{15}$ closer to 3 or (4) ?
9 16

Is $\sqrt{40}$ closer to (6) or 7 ?
36 49

Is $\sqrt{70}$ closer to (8) or 9 ?
64 81

PART 5 - Estimate the square root to the nearest tenth.
Determine what numbers it is between & which it is closer to, then try squaring a few to see which is closest.

Example: $\sqrt{39}$ *I know it is between 6 and 7, and that it is closer to 6.*

I'll try 6.1:
6.1 × 6.1
6 1
366
37.21

I'll see if 6.2 is closer to 39:
6.2 × 6.2
124
372
38.44

It still isn't over 39, so I'll try 6.3:
6.3 × 6.3
189
378
39.69

this is closest to 39, so ***the answer is 6.2***

$\sqrt{72}$ Between 8 + 9 a little closer to 8

8.4 × 8.4
336
672
70.56

8.5 × 8.5
425
680
72.25 ← Close!

8.5

$\sqrt{15}$ Between 3 + 4 Much closer to 4

3.9 × 3.9
351
117
15.21

3.8 × 3.8
304
114
14.44

Closer → 3.9