Name: _____ Date: _____ Hour: _____

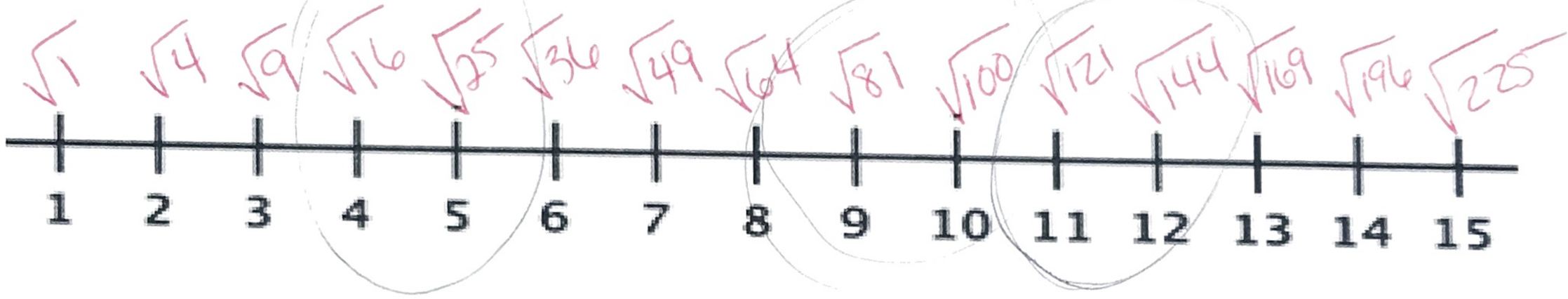
Unit 4A: Day 5: Estimating Square Roots

Focus Question: What is a good estimate when the side length is not a perfect square?

A. Perfect Squares

Place each of the square roots in the box on the number line below.

$\sqrt{25}$	$\sqrt{144}$	$\sqrt{225}$	$\sqrt{81}$	$\sqrt{1}$
$\sqrt{9}$	$\sqrt{196}$	$\sqrt{4}$	$\sqrt{64}$	$\sqrt{100}$
$\sqrt{121}$	$\sqrt{49}$	$\sqrt{169}$	$\sqrt{16}$	$\sqrt{36}$



B. Non-Perfect Squares

Each of the numbers below is an area of a square that is considered "non-perfect." This means that its side length is not a whole number.

Find the exact side length. Then draw the section of the number line that would be needed to estimate the side length. Finally, give an estimate to the nearest tenth.

Area of the Square	Exact Side Length	Section of the Number Line	Estimate of the side length
20	$\sqrt{20}$	$\sqrt{16}$ (4) $\sqrt{20}$ (5) $\sqrt{25}$ — 4 … 15	≈ 4.45
125	$\sqrt{125}$	$\sqrt{121}$ (4) $\sqrt{125}$ (19) $\sqrt{144}$ — 11 … 12	≈ 11.10
95	$\sqrt{95}$	$\sqrt{81}$ (14) $\sqrt{95}$ (5) $\sqrt{100}$ — 9 … 10	≈ 9.82
82	$\sqrt{82}$	$\sqrt{81}$ (1) $\sqrt{82}$ (18) $\sqrt{100}$ — 9 … 10	≈ 9.01
200	$\sqrt{200}$	$\sqrt{196}$ (4) $\sqrt{200}$ (25) $\sqrt{225}$ — 14 … 15	≈ 14.12
54	$\sqrt{54}$	$\sqrt{49}$ (5) $\sqrt{54}$ (10) $\sqrt{64}$ — 7 … 7.50 … 8	≈ 7.25

C. Dalida claims that $\sqrt{8}+\sqrt{8}=\sqrt{16}$ because 8 plus 8 is 16. Is she right? Explain.

No! $\sqrt{16}=4$
$\sqrt{8}$ is close to 3
b/c $\sqrt{9}=3$
$3+3 \neq 4$

D. Practice! Estimate each square root.

O. $\sqrt{78}$

$\sqrt{64}$ (14) (3) $\sqrt{81}$
8 — 8.50 — 9

≈ 8.9

E. $\sqrt{31}$

$\sqrt{25}$ (6) (5) $\sqrt{36}$
5 — 5.50 — 6

≈ 5.54

S. $\sqrt{150}$

$\sqrt{144}$ (6) (19) $\sqrt{169}$
12 — 12.50 — 13

≈ 12.15

Y. $\sqrt{42}$

$\sqrt{36}$ (6) (7) $\sqrt{49}$
6 — 6.50 — 7

≈ 6.45

B. $\sqrt{90}$

$\sqrt{81}$ (9) (10) $\sqrt{100}$
9 — 9.50 — 10

≈ 9.45

N. $\sqrt{135}$

$\sqrt{121}$ (14) (9) $\sqrt{144}$
11 — 11.50 — 12

≈ 11.60

O. $\sqrt{175}$

$\sqrt{169}$ (6) (21) $\sqrt{196}$
13 — 13.50 — 14

13.07

O. $\sqrt{11}$

$\sqrt{9}$ (+2) (5) $\sqrt{16}$
3 — 3.50 — 4

≈ 3.19

R. $\sqrt{58}$

$\sqrt{49}$ (9) (6) $\sqrt{64}$
7 — 7.50 — 8

≈ 7.62