Name: _____ Date: _____

Square Roots Worksheet

(See the hints on the other side of this page.)

Solve.

1 a. $\sqrt{36}$

1 b. $\sqrt{64}$

2 a. $\sqrt{100}$

2 b. $\sqrt{169}$

3 a. $\sqrt{81}$

3 b. $\sqrt{289}$

4 a. $\sqrt{144}$

4 b. $\sqrt{196}$

5 a. $\sqrt{256}$

5 b. $\sqrt{225}$

6 a. $\sqrt{9}$

6 b. $\sqrt{1}$

7 a. $\sqrt{0}$

7 b. $\sqrt{49}$

8 a. $\sqrt{121}$

8 b. $\sqrt{25}$

I completed this assignment by myself without using a calculator, internet, or any outside help.

Signed: _____

Square Roots Hints

We know that any number that ends in 1, when squared, will produce 1 as the last digit. So 1x1 = 1, 11x11 = 121, 21x21 = 441, etc. Note that they all end in 1. This is true for all the other digits as well:

1: the square will end in 1
2: the square will end in 4
3: the square will end in 9
4: the square will end in 6
5: the square will end in 5
6: the square will end in 6
7: the square will end in 9
8: the square will end in 4
9: the square will end in 1
0: the square will end in 0

Note that it is impossible for a perfect square to end in 2, 3, 7, or 8.

Let's say you are asked to find the square root of 529. We know that the only possibility is that the square root starts with 3 or 7, because no other numbers will produce a number that ends in 9 (like 529). We also know that the square root must be greater than 10. So, we could test 13, 17, 23, 27, 33, 37, etc. until we find the right answer.

Note that just hitting the square root key on your calculator is cheating. You must do these problems using just pencil and paper, without any outside help.

Estimating Square Roots

Suppose I ask you to find the nearest integer approximation of the square root of 200. We know that 200 = 2 x 100. So, it is the square root of 2 times the square root of 100. I hope you know the square root of 100 is 10. So, we just have to figure out the square root of 2. The square root of 2 is between 1 and 2, because 1x1 = 1 and 2x2 = 4. So, it's partway between 1 and 2, maybe 1/3 of the way. So, we might start testing 1.3, 1.4, etc. 1.3 x 1.3 = 1.69 (you can figure this out on paper). 1.4 x 1.4 = 1.96. So, the square root of 200 is that times 10, or about 14. Use similar estimations to figure the following square roots.

1. $\sqrt{300} =$ _____
2. $\sqrt{500} =$ _____
3. $\sqrt{600} =$ _____
4. $\sqrt{700} =$ _____
5. $\sqrt{800} =$ _____
6. $\sqrt{1000} =$ _____
7. $\sqrt{5000} =$ _____
8. $\sqrt{8000} =$ _____