Date: _____

Squares & Square Roots

A. DEFINITIONS:

1. square root - a number that, when multiplied by _____, equals another number

eg. the square root of 64 is __ and ___ since 8 x 8 = 64 and (-8) x (-8) = 64

the square root of 8.41 is ____ and ____ since 2.9 x 2.9 = 8.41 and (-2.9) x (-2.9) = 8.41

2. principal square root - it is the _____ square root

- we use this symbol $\sqrt{}$

eg. the principal square root of 64 is 8 since 8 x 8 = ____

the principal square root of 8.41 is 2.9 since 2.9 x 2.9 = _____

3. perfect square - a number that has a _____ number as its principal square root

- natural numbers are the _____ numbers (1, 2, 3, 4, 5, …)

eg. 49 is a perfect square because its principal square root is _, a natural number

12.25 is ___ a perfect square because its principal square root is ___, and this is not a natural number

I. Find the following square roots. (You must memorize these perfect squares!)

a. √4 = ____ b. √9 = ____ c. √16 = ____ d. √25 = ____

e. √36 = ____ f. √49 = ____ g. √64 = ____ h. √81 = ____

i. √100 = ____ j. √121 = ____ k. √144 = ____

II. Find the following square roots.

a. √0.04 = ____ b. √0.16 = ____ c. √1.21 = ____

d. √1.44 = ____ e. √225 = ____ f. √196 = ____

B. ESTIMATING SQUARE ROOTS OF NUMBERS THAT ARE NOT PERFECT SQUARES

√12 - this number is _____ a perfect square
- we can _____ the answer
- we look for the two _____ perfect squares to 12 ----> 9 and 16

√16 = 4
√12
√9 = 3

} 12 is almost in the middle between 16 and 9

it is closer to 9, so √12 should be closer to 3 than 4

√12 ≐ _____

this symbol means 'approximately equal'

I. Estimate the square roots of these numbers. Use your calculator to check afterwards.

a. √15 b. √37 c. √50 d. √93

II. Find a number that has a square root between each of the following numbers.
The first one is done for you.

a. 6 and 7 b. 5 and 6 c. 10 and 11

6 is the square root of 36

7 is the square root of 49

So, a square root that is between 6 and 7 must be of numbers between 36 and 49.
I can choose any number between those two numbers - I choose 39.

Remember √39 will fall between 6 and 7.