A1 Notes : Perfect Squares & Factor Trees.

Note Title 29/09/2014

Prime Numbers : can only be divisible by itself & 1.

1, 2, 3, 5, 7, 11, 13, ...

Prime Factorization : (aka Factor Trees)
break a number into its prime "pieces" factors.

if # is even ÷ 2 , if # is odd ÷ 3, 5, 7...

1. 24

2 ^ 12
2 ^ 6
2 3

$24 = \underbrace{2 \times 2 \times 2}_{2^3} \times 3$

$2^3 \times 3^1$ exponents

4
6 | A = 24

3
8 | A = 24

2. 36 Perfect Square

2 ^ 18
2 ^ 9
3 3

$36 = \underbrace{2 \times 2}_{} \times \underbrace{3 \times 3}_{}$

$2^2 \times 3^2$ ← when exponents are EVEN

$2^1 \times 3^1 \times 2^1 3^1$ Split into 2 equal groups

6×6

6
6 | 36

Prime Factorize. Is it a Perfect Square?

3. 40

2 ^ 20
2 ^ 10
2 5

$40 = \underbrace{2 \times 2 \times 2}_{} \times 5$

$2^3 \times 5^1$

Not Perfect

8
5 | 40

4. 64

2 ^ 32
2 ^ 16
2 ^ 8
2 ^ 4
2 2

$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

2^6 ← even with 1 # means

$2^3 \times 2^3$

8×8

8 | 64
8

5. 81

3 27

3 9

3 3

$81 = 3 \times 3 \times 3 \times 3$

$= 3^4$

$3^2 \times 3^2$

9×9

yes $\boxed{81}$ 9, 9

6. 144

2 72

2 36

2 18

2 9

3 3

$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$

$2^4 \times 3^2$

$2^2 \times 3^1 \times 2^2 \times 3^1$

12×12

yes $\boxed{144}$ 12, 12

$5^3 \times 2^1$

$5^3 \times 2^1$