

Alg 1 BE MONDAY 1-17-11

① $5^2 = ?$

② $\sqrt{25} = ?$

③ $(x+5)^2 = ?$

CAREFUL! Use the definition of base and exponent

④ $\sqrt{x^2 + 10x + 25} = ?$

⑤ List all the factors of 56.

BE Answers

① 25

② 5

③ $x^2 + 10x + 25$

④ $x+5$

⑤

prime number

(A positive integer) 1
 $A > 1$ NATURAL
NUMBER THAT ONLY
HAS factors of
1 and itself.

factors

a and b are factors of c
if $a \cdot b = c$

factors divide evenly into
their product

*(M) "factories make products"

FTOA

Fundamental Theorem of Arith-
metic

"EVERY integer > 1 can be
expressed as a unique product
of prime factors"

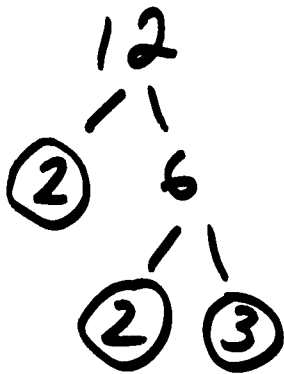
Yikes!! This is almost like saying the
prime numbers are the atoms of
which all other numbers are made!
Can they be this important? Why
would 5 be more important than 6?

prime factorization

the process of finding all the prime factors of a number

use a factor tree

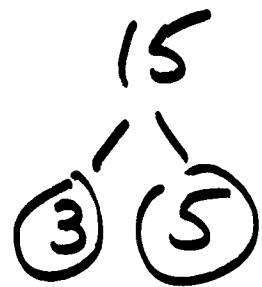
(Ex)



$$\boxed{2 \cdot 2 \cdot 3} \text{ or } \boxed{2^2 \cdot 3}$$

P.F. of 12

(Ex)



$$\boxed{3 \cdot 5}$$

P.F. of 15

(Ex)

19

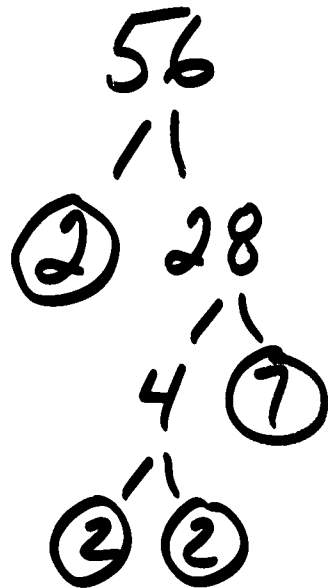
prime, only factors

are 1, 19.

Note: 1 is NOT a prime or a composite number, it is a special case.
 NOT-PRIMES

There are some important uses for a P.F., one is finding all the factors of a number without guess and check,

(EX)



$$\boxed{2 \cdot 2 \cdot 2 \cdot 7}$$

P.F.

Take all product combinations, use all 4 numbers each time

$$2 \cdot 28$$

$$4 \cdot 14$$

$$8 \cdot 7$$

The factors of 56 are (don't forget):
 * 1 AND 56

$$\boxed{1, 2, 4, 7, 8, 14, 28}$$

Three common, and important, binomial • binomial patterns:

① $(a+b)^2 = (a+b)(a+b) = a^2 + 2ab + b^2$

ⓔ (x+6)² = (x+6)(x+6) = x² + 12x + 36

ⓔ (2x+1)² = (2x+1)(2x+1) = 4x² + 4x + 1

② $(a-b)^2 = (a-b)(a-b) = a^2 - 2ab + b^2$

ⓔ (x-6)² = (x-6)(x-6) = x² - 12x + 36

ⓔ (2x-1)² = (2x-1)(2x-1) = 4x² - 4x + 1

③ $(a-b)(a+b) = a^2 - b^2$

ⓔ (x-6)(x+6) = x² - 36

ⓔ (2x-1)(2x+1) = 4x² - 1

Summary: $(a \pm b)^2 = a^2 \pm 2ab + b^2$
Ch. 8-8 $(a+b)(a-b) = a^2 - b^2$

↓
Difference of Squares

Find each product without multiplying,
just use the correct "pattern" 5

$$\textcircled{\text{Ex}} \quad (x+3)(x-3) = x^2 - 9$$

$$\textcircled{\text{Ex}} \quad (x-1)(x+1) = x^2 - 1$$

$$\textcircled{\text{Ex}} \quad (2x-y)(2x+y) = 4x^2 - y^2$$

$$\textcircled{\text{Ex}} \quad (x+3)(x+3) = x^2 + 6x + 9$$

or
 $(x+3)^2$

$$\textcircled{\text{Ex}} \quad (2x-8)(2x-8) = 4x^2 - 32x + 64$$

or
 $(2x-8)^2$

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- Homework: • Read Ch. 8-8
 - Pg 461 # 5-10
 - Pg 477 # 1, # 4-9.