Algebra Ch. 12 Factoring

12-1 Warm-Up

1. List all numbers that can be multiplied to equal 30. ___ $1, 2, 3, 5, 6, 10, 15, 30$ ← factors of 30

2. List all numbers that go into 45 and 27. ___ $1, 3, 9,$ _____

3. Name 5 multiples of 6. ___ $6, 12, 18, 24, 30, 36$
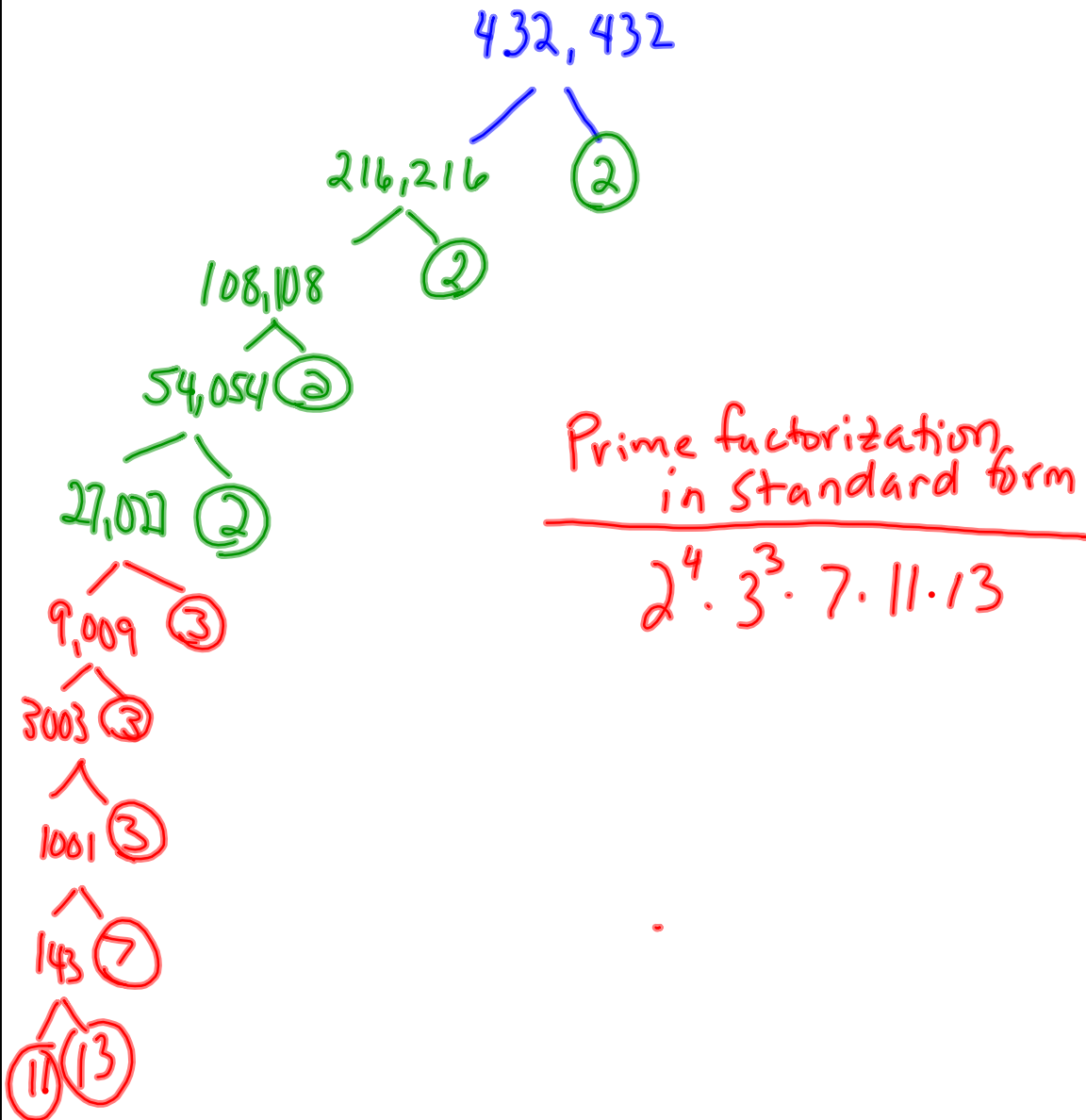
$4, 8, 12, 16, 20, 24$

Algebra 12-1 Factoring Integers

Word	Definition	Example
Factors	# or variable that an expression is divisible by	$4x$: $1x, 2x, 4x$
Multiple	what you multiply by	40 is a multiple of: $1, 2, 4, 5, 8, 10, 20$
Common Factor	a factor that 2 expressions have in common	$33x \quad 22x^2$ Common Factor: $11x$
Prime Numbers	A # that can be divided only by 1. (whole #s > 1)	$2, 3, 7, 5, 11, 13, \ldots$

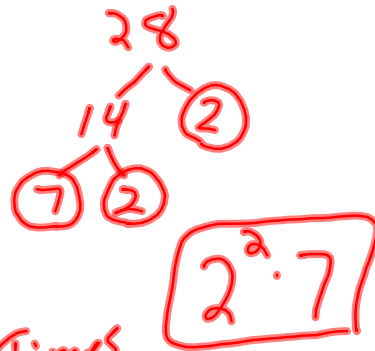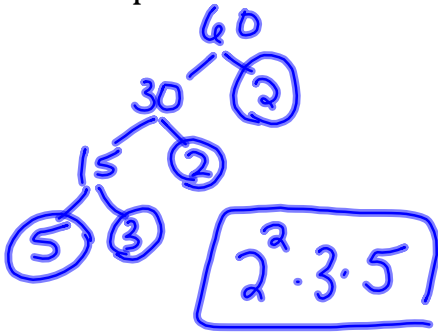|		
Composite Numbers	Not Prime	4, 8, 12
Prime Factorization	breakdown a number by factoring *Must be prime	see notes
Standard Form	Putting prime factorizations in order from least to greatest	$2 \cdot 2 \cdot 2 \cdot 5 = 2^3 \cdot 5$

Examples

1. List prime numbers between 10 and 25. $\underline{\quad 11, \quad 13, \quad 17, \quad 19, \quad 23, \quad}$

2. Write the prime factorization of 432, 432 in standard form.

432, 432

216, 216 ②

108, 108 ②

54, 054 ②

27, 027 ②

9, 009 ③

3003 ③

1001 ③

143 ⑦

⑪ ⑬

Prime factorization
in Standard form

$2^4 \cdot 3^3 \cdot 7 \cdot 11 \cdot 13$

3. Use prime factorizations of 60 and 28 to...

60
30 — 2
15 — 2
5 — 3

$2^2 \cdot 3 \cdot 5$

28
14 — 2
7 — 2

$2^2 \cdot 7$

a. Write the prime factorization of 60x28.

Times

$(2^2 \cdot 3 \cdot 5)(2^2 \cdot 7) = 2^4 \cdot 3 \cdot 5 \cdot 7$

b. Write 28/60 in lowest terms.

$$\frac{28}{60} = \frac{2^2 \cdot 7}{2^2 \cdot 3 \cdot 5} = \frac{7}{15}$$

Assignment: 12-1 #'s 1-7, 10-13, 15-18, give examples for 18, 20