Math 6 Unit 1 worksheet: Prime factorization

Name _____ Date _____ Period _____

1. Use a factor tree to find the prime factorization. Write it with exponents, smallest prime first, and check by multiplying.

(a) 72

(b) 150

(c) 156

(d) 231

(e) 288

(f) 500

2. Use the ladder to find the prime factorization. Write it with exponents, smallest prime first.

(a) 252

(b) 325

(c) 1,078

(d) 2,025

(e) 1,716

(f) 391

3. Fill in the missing exponent: $396 = 2^{\square} \cdot 3^2 \cdot 11$.

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4. Mateo packs 105 bars of soap into a box as one solid block, so many bars long, so many wide and so many high. No edge of the block is just 1 bar long.

(a) Find the prime factorization of 105.

(b) How many bars long, wide and high is the block?

(c) Explain why there is no other way to do it, apart from turning the box around.

5. (a) Find the smallest whole number whose factor tree ends in exactly five circled primes (count a prime each time it is circled).

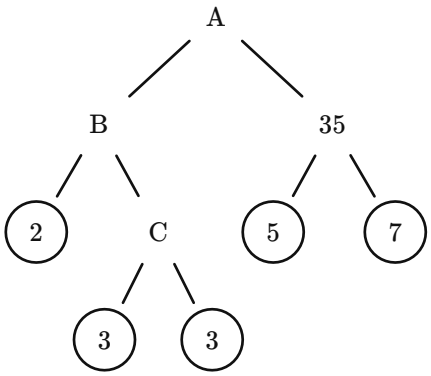
(b) Find the smallest whole number whose prime factorization uses three different primes, each with exponent 2.

Explain each answer.

6. Jasmine's factor tree has lost three of its numbers, marked A, B and C. The circled numbers are prime.

(a) Find C, B and A.

(b) Write the prime factorization of A with exponents, smallest prime first.



7. Emma used a ladder on 1,260 and wrote this:

Divide by	Number
4	1,260
9	315
5	35
7	7
	1

She wrote $1{,}260 = 4 \cdot 9 \cdot 5 \cdot 7$. Every division is correct.

(a) Explain what is wrong with her answer.

(b) Find the prime factorization of 1,260, written with exponents.

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