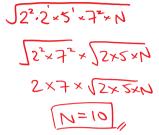
Math 8 Honours Assignment 1.4 Prime Factorization and Factors Part 2:

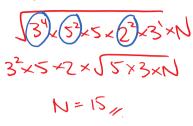
1. Find the lowest value of N such that the square root will become a positive integer:

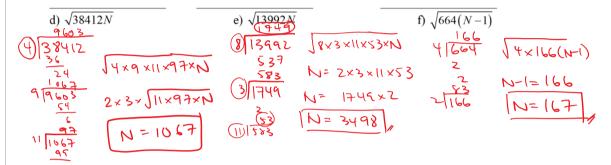


b)
$$\sqrt{4^27^25^2N}$$

c)
$$\sqrt{3^4 5^3 12N}$$







2. Find the lowest value of N such that the cube root will become a positive integer:

a.
$$\sqrt[3]{2^3 5^1 7^2 N}$$

b.
$$\sqrt[3]{4^27^25^2}N$$

$$a^{-3/245312N}$$

3. Indicate the number of factors for each of the following numbers:

a)
$$N = 2^3 3^5$$

b)
$$N = 2^3 3^4 (25)$$

c)
$$N = 3888 = 16 \times 24$$



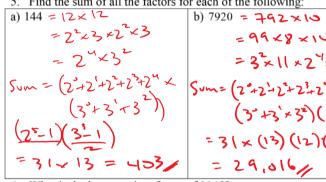
a)
$$2^{3}3^{N}$$
 (8 factors)

b)
$$(8) \times 27N$$
 (48 factors)

c)
$$2^3 3^4 N^2$$
 (56 factors)

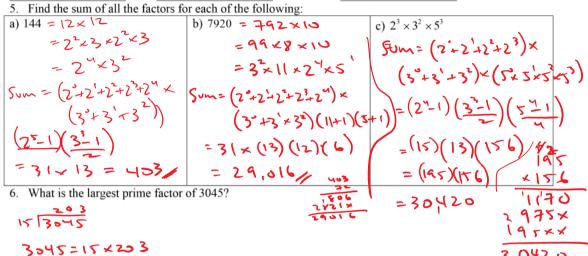
$$2^{7} + 3^{6} \rightarrow N^{2} = (2^{2} \times 3^{6})^{2}$$

5. Find the sum of all the factors for each of the following:



b)
$$7920 = 792 \times 10$$

 $= 99 \times 8 \times 10$
 $= 3^{2} \times 11 \times 2^{4} \times 5$
 $5^{4} \times (2^{4} + 2^{4} + 2^{4} + 2^{4}) \times (3^{4} + 3^{4}) \times (11 + 1)$
 $= 31 \times (13)(12)(6)$



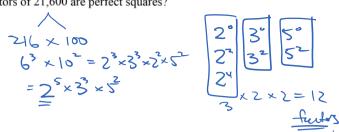
LACKEST PRINE FATHE = 203

7. Find *n*, such that $2^3 3^2 n = 10!$

2 x 3 x n = 1 x 2 x 3 x 4 x 5 x 6 x 7 x 8 x 9 x 10 N= 1/2 3×4×8×6×7×10 12 = (00 × 12 × 42 = 22400 / = 22400/

8. How many factors of 4000 are perfect squares?

9. How many factors of 21,600 are perfect squares?



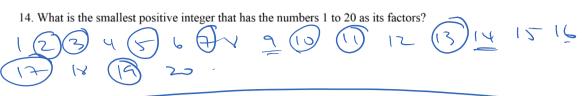
10. What is the least positive integer that is not a factor of 7!?

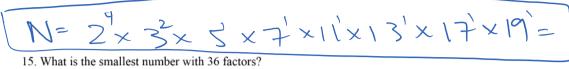


11. How many positive integral factors does N have if $N = 6^2 \times 15$?

12. What is the smallest positive integer by which 80 can be multiplied so that the product will be a perfect cube?

13. What is the smallest number that has 1 to 10 as its factors?



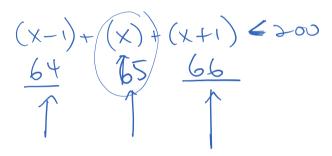


$$\frac{2 \times 3 \times 2 \times 3}{1 + 1 + 1} = 36$$

$$2^{2} \times 3^{2} \times 5^{1} = 1260$$

$$2^{3} \times 3^{2} \times 5^{2} = 1800$$

16. What is the sum of three greatest consecutive integers less than 200 for which the least number has 4 as a factor, the next has 5 as a factor, and the largest number has 6 as its factor?



17. What is the smallest positive integer n, for which 88 is a factor of n!?

18. Two positive integers have a GCF of $2 \times 3 \times 5$ and a LCM of $2^3 \times 3^4 \times 5 \times 7$. If one of the numbers is 210, find the other number.

19. Find the smallest number N, such that $2^33^4N^2$ has 56 factors.

20. Two numbers are "relatively prime" if they do not share any common factors other than 1. How many positive integers less than or equal to 40 are relatively prime to 40?

1 7 3 4 7 8 9 18 1 7 13 M 18 16 17 18 (19) 25 21 12 22 24 12 16 (27) 28 (29) 35 31/32 (37) 34 (37) 48

40 = 8×5 = 73×5

21. Challenge: Suppose there are 1000 lockers and 1000 people. The first person opens all the lockers; the second person closes every second locker; the third person changes the state of every third locker [ie: if it's open, he closes it or if it's closed, he opens it]. This process continues, where the nth person changes the state of every nth locker. After all 1000 people have gone through, how many lockers are open?																			
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