

Author: _____

Group Members:

1. Find the prime factorization of the following numbers.

$24 =$

$80 =$

$45 =$

$24^2 =$

$80^2 =$

$45^2 =$

$3 \cdot 24^2 =$

$3 \cdot 80^2 =$

$3 \cdot 45^2 =$

2. For each of the numbers below, how many threes are in their prime factorization.

24

80

45

24^2

80^2

45^2

$3 \cdot 24^2$

$3 \cdot 80^2$

$3 \cdot 45^2$

3. For each of the numbers below, are there an odd or even amount of threes in their prime factorization.

24

80

45

24^2

80^2

45^2

$3 \cdot 24^2$

$3 \cdot 80^2$

$3 \cdot 45^2$

7. Answer the following questions assuming b is some natural number.

(a) Is there an even amount or an odd amount of twos in the prime factorization of $2b^2$?

(b) Is there an even amount or an odd amount of twos in the prime factorization of $12b^2$?

(c) Is there an even amount or an odd amount of threes in the prime factorization of $12b^2$?

(d) Is there an even amount or an odd amount of fives in the prime factorization of $35b^2$?

(e) Is there an even amount or an odd amount of sevens in the prime factorization of $35b^2$?

(f) Is there an even amount or an odd amount of threes in the prime factorization of $27b^2$?

(g) Is there an even amount or an odd amount of threes in the prime factorization of $9b^2$?

8. If possible find natural numbers a and b that satisfy the following equations. If it is not possible, explain why not.

(a) $9b^2 = a^2$

(b) $3b^2 = a^2$

(c) $2b^2 = a^2$

(d) $12b^2 = a^2$

(e) $35b^2 = a^2$

(f) $27b^2 = a^2$