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Name: Date:

**Topic:** Factors and Multiples

Find the least value of ***k*** when ***nk*** is a perfect square or a cube, where n is an integer.

**1- Expressed as the product of prime factors,**

198 = 2 × 32 × 11 and 18 =2 × 32.

Use these results to find

a- The smallest integer, *k*, such that 198 ***k*** is a **perfect square**.

b- The smallest integer, *k*, such that 18 ***k*** is a **perfect cube**.

**2-** Expressed as the product of prime factors,

168 = 3 × 23 × 7

a- Express **108** as a product of prime factors and write your answer in index notation.

b. - Use these results to find

i- the smallest integer, *n*, such that 108 ***n*** is a **perfect cube**.

ii- the smallest integer, *n*, such that 168 ***n*** is a **perfect Square**.

3- Expressed as the product of prime factors, 480 = 3 × 25 × 5 and 576 =26 × 32 . Use

these results to find

a-The smallest integer, *p*, such that 576 ***p*** is a **perfect cube**

b- The smallest integer, *p*, such that 480 ***p*** is a **perfect square**

4- a- Express 99 as the product of its prime factors.

b- Find the smallest possible integer value of *n* for which 99*n* is a **perfect square**.

5- a- Express 60 as a product of prime factors and write your answer in index notation.

b- Find the smallest possible integer *m* such that 60 ***m*** is a square number.