

## **Number Theory**

### **Notes**

*Last digit calculation*

*Perfect squares' prime factorization*

*Arithmetic sequence's count*

*“Between...and...” vs. “From...to...”*

**Discussion questions**

1. The product of two whole numbers is 24. What is the smallest sum of these two numbers?

2. What is the last digit in calculation  $2^{15} \times 6^{6666}$ ?

3. The product of natural number  $n$  and 176 is a perfect square. What is the least value of  $n$ ?

4. The product of natural number  $n$  and 176 is a perfect cube. What is the least value of  $n$ ?

5. How many perfect cubes lie between  $2^8 + 2$  and  $2^{18} + 2$ ?

6. In a sequence made of natural numbers, starting from the third number, every number is the product of the previous two numbers. The sixth number is 4000, what is the first number?

### **Practice questions**

1. A prime number is called a “Superprime” if doubling it, and then subtracting 1, results in another prime number. What is the number of Superprimes less than 15?

2. The product of three different positive integers is 144. What is the maximum possible sum of these three integers?

3. The product of natural number  $p$  and 15125 is a perfect square. What is the least value of  $p$ ?