1. Identify the type of number (Rational or Irrational) in the following (also give the reason):
    a. $5 - \sqrt{5} + \frac{1}{\sqrt{5}}$
    b. $3 - \sqrt{64}$
    c. $\sqrt{15} - 4\sqrt{3}$
    d. $(3 + \sqrt{5})(3 - \sqrt{5})$

2. If two positive integers a and b are written as $a = x^3 y^2$ and $b = xy^3$, where x, y are prime numbers, then find HCF (a, b) and LCM (a, b).
3. The HCF of two numbers is 5 and their product is 150, then find their LCM.
4. What is the HCF of smallest primer number and the smallest composite number?
5. If $HCF(336, 54) = 6$, then find $LCM(336, 54)$.
6. Find the HCF and LCM of the following using prime factorization:
    a. 230,15,20
    b. 200,125,650
    c. 91,1300,2100
    d. 124,144,108
7. Draw the factor tree for the following numbers:
    a. 15300
    b. 2160
    c. 14424
8. Taniya have 54 football cards, 72 volleyball cards, and 63 basketball cards and she want to put them in a binder. Each page of the binder should have cards from a single sport, and there should be the same number of cards on each page.

    a. What is the greatest number of cards, Taniya can put on a page?
    b. How many pages will Taniya need for each sport?
9. Two oil tankers contain 825 litres and 675 litres of kerosene oil respectively.


    i) What is the maximum capacity of a container which can measure the kerosene oil of both the tankers when used an exact number of times?
    ii) How many times we have to use container for both tanker to fill?

10. The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they change simultaneously at 7 AM, at what time will they change simultaneously again?
11. Four satellites revolve around the earth once every 6, 8, 10, and 15 hours, respectively. If the satellites are initially lined up, how many hours must pass before they will again be lined up?
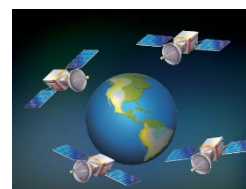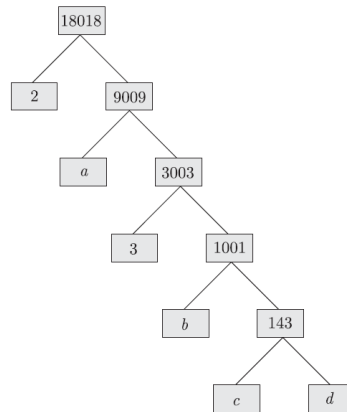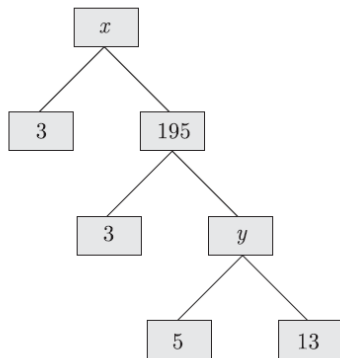
12. Complete the following factor trees

(i)
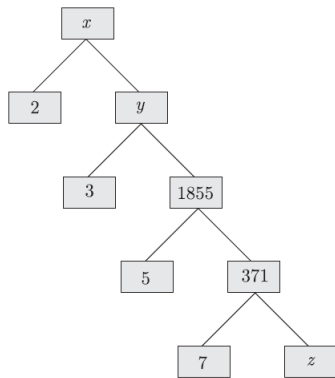
(ii)

(iii)

13. Prove that the following are irrational numbers
    a. $\sqrt{8}$
    b. $3\sqrt{2}$
14. Prove that $-5 + 2\sqrt{3}$ is an irrational number if given that $\sqrt{3}$ is an irrational number.
15. Prove that $\frac{1}{\sqrt{5}}$ is an irrational number.

ANSWERS:

1. (a) Irrational   (b) Rational   (c) Irrational   (d) Rational
2. HCF: xy^2 LCM: x^3y^3
3. 30
4. 2
5. 3024
6. (a) LCM: 1380 HCF: 5   (b) LCM: 13000 HCF: 25   (c) LCM: 27300 HCF: 1
    (d)   LCM: 13392 HCF: 4
7. SELF
8. (a) 9 cards (b) Pages needed: 6,8 and 9
9. (a) 75 liters (b) 11 and 9
10. 07:07:12
11. 120 hours
12. SELF
13. To Prove
14. To Prove
15. To Prove