GAINING APEX COACHING CENTRE
(Where Toppers make… Toppers) (By Dapinder Sir)
EXERCISE

Q.1 State whether the given statement is true or false :
(i) The sum of two rationals is always rational
(ii) The product of two rationals is always rational
(iii) The sum of two irrationals is an irrational.
(iv) The product of two irrationals is an irrational
(v) The sum of a rational and an irrational is irrational
(vi) The product of a rational and an irrational is irrational

Q.2 Define (i) rational numbers (ii) irrational numbers (iii) real numbers.

Q.3 Classify the following numbers as rational or irrational :
(i) $\frac{22}{7}$ (ii) 3.1416
(iii) π (iv) $3.\overline{142857}$
(v) 5.636363..... (vi) 2.040040004.....
(vii) 1.535335333.... (viii) 3.121221222...
(ix) $\sqrt{21}$ (x) $\sqrt[3]{3}$

Q.4 Prove that each of the following numbers is irrational :
(i) $\sqrt{6}$ (ii) $(2-\sqrt{3})$
(iii) $(3+\sqrt{2})$ (iv) $(2+\sqrt{5})$
(v) $(5+3\sqrt{2})$ (vi) $3\sqrt{7}$
(vii) $\frac{3}{\sqrt{5}}$ (viii) $(2-3\sqrt{5})$
(ix) $(\sqrt{3}+\sqrt{5})$

Q.5 Prove that $\frac{1}{\sqrt{3}}$ is irrational.

Q.6 Without actual division, show that each of the following rational numbers is a non-terminating repeating decimal :
(i) $\frac{11}{(2^3\times 3)}$ (ii) $\frac{73}{(2^3\times 3^3\times 5)}$ (iii) $\frac{9}{35}$
(iv) $\frac{32}{147}$ (v) $\frac{64}{455}$ (vi) $\frac{77}{210}$
(vii) $\frac{29}{343}$ (viii) $\frac{129}{(2^2\times 5^7\times 7^5)}$

Q.7 Without actual divison, show that each of the following rational numbers is a terminating decimal. Express each in decimal form :
(i) $\frac{23}{(2^3\times 5^2)}$ (ii) $\frac{24}{125}$ (iii) $\frac{17}{320}$
(iv) $\frac{171}{800}$ (v) $\frac{15}{1600}$ (vi) $\frac{19}{3125}$

Q.8 Express each of the following as a fraction in simplest form :
(i) $0.\overline{8}$ (ii) $2.\overline{4}$ (iii) $0.\overline{24}$
(iv) $0.1\overline{2}$ (v) $2.2\overline{4}$ (vi) $0.3\overline{65}$

Q.9 Decide whether the given number is rational or not :
(i) 53.123456789 (ii) $31.\overline{123456789}$
(iii) 0.12012001200012...
Give reason to support your answer.

Q.10 What do you mean by Euclid's division algorithm.

Q.11 A number when divided by 61 gives 27 as quotient and 32 as remainder. Find the number.

Q.12 By what number should 1365 be divided to get 31 as quotient and 32 as remainder ?

Q.13 Using Euclid's algorithm, find the HCF of
(i) 405 and 2520 (ii) 504 and 1188
(iii) 960 and 1575

Q.14 Using prime factorisation, find the HCF and LCM of
(i) 144, 198 (ii) 396, 1080
(iii) 1152, 1664

Q.15 Using prime factorisation, find the HCF and LCM of
(i) 24, 36, 40

(ii) 30, 72, 432
(iii) 21, 28, 36, 45

Q.16 The HCF of two numbers is 23 and their LCM is 1449. If one of the numbers is 161, find the other.

Q.17 The HCF of two numbers is 11 and their LCM is 7700. If one of the numbers is 275, find the other.

Q.18 Three pieces of timber 42 m, 49 m and 63 m long have to be divided into planks of the same length. What is the greatest possible length of each plank ?

Q.19 Find the greatest possible length which can be used to measure exactly the length 7 m, 3 m 85 cm and 12 m 95 cm.

Q.20 Find the maximum number of students among whom 1001 pens and 910 pencils can be distributed in such a way that each student gets the same number of pens and the same number of pencils.

Q.21 Three sets of English, Mathematics and Science books containing 336, 240 and 96 books respectively have to be stacked in such a way that all the books are stored subject wise and the height of each stack is the same. How many stacks will be there ?

Q.22 Find the least number of square tiles required to pave the ceiling of a room 15 m 17 cm long and 9 m 2 cm broad.

Q.23 Three measuring rods are 64 cm, 80 cm and 96 cm in length. Find the least length of cloth that can be measured an exact number of times, using any of the rods.

Q.24 The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they all change simultaneously at 8 hours, then at what time will they again change simultaneously ?

Q.25 An electronic device makes a beep after every 60 seconds. Another device makes a beep after every 62 seconds. They beeped together at 10 am. At what time will they beep together at the earliest ?

Q.26 Six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10, 12 minutes respectively. In 30 hours, how many times do they toll together ?

ANSWER KEY

1. (i) True (ii) True (iii) False (iv) False (v) True (vi) True

3. (i) Rational (ii) Rational (iii) Irrational (iv) Rational (v) Rational (vi) Irrational
(vii) Irrational (viii) Irrational (ix) Irrational (x) Irrational

7. (i) 0.115 (ii) 0.192 (iii) 0.053125 (iv) 0.21375 (v) 0.009375 (vi) 0.00608

8. (i) $\frac{8}{9}$ (ii) $\frac{22}{9}$ (iii) $\frac{8}{33}$ (iv) $\frac{11}{90}$ (v) $\frac{101}{45}$ (vi) $\frac{181}{495}$

9. (i) Rational, since it is a terminating decimal (ii) Rational, since it is a repeating decimal
(iii) Not rational, since it is a non-terminating and non-repeating decimal

11. 1679 **12.** 43 **13.** (i) 45 (ii) 36 (iii) 15

14. (i) HCF = 18, LCM = 1584 (ii) HCF = 36, LCM = 11880 (iii) HCF = 128, LCM = 14976

15. (i) HCF = 4, LCM = 360 (ii) HCF = 6, LCM = 2160 (iii) HCF = 1, LCM = 1260

16. 207 **17.** 308 **18.** 7 m **19.** 35 cm **20.** 91 **21.** 14

22. 814 **23.** 9.6 m **24.** 8 : 7 : 12 hrs **25.** 10 : 31 hrs **26.** 16 times