28/05/2020

Ch-1
Real Numbers
Exercise 1.6

Q.1 (i) $\frac{23}{8} = \frac{23}{2^3}$

→ Terminating

(ii) $\frac{125}{441}$

3	441
3	147
7	49
7	7
	1

$\frac{125}{441} = \frac{125}{3^3 \times 7^3}$

→ Non-terminating repeating

(vi) $\frac{987}{10500}$

2	10500
2	5250
3	2625
5	875
5	175
5	35
7	7
	1

$\frac{987}{10500} = \frac{987}{2^2 \times 3 \times 5^3 \times 7}$

→ Non-terminating repeating.

Q.2 (i) $\frac{3}{8} = \frac{3}{2^3} = \frac{3 \times 5^3}{2^3 \times 5^3} = \frac{375}{10^3} = \boxed{0.375}$

(ii) $\frac{13}{125} = \frac{13}{5^3} = \frac{13 \times 2^3}{5^3 \times 2^3} = \frac{104}{10^3} = \boxed{0.104}$

(iii) $\frac{7}{80}$

2	80
2	40
2	20
2	10
5	5
	1

$\frac{7}{80} = \frac{7}{2^4 \times 5^1} = \frac{7 \times 5^3}{2^4 \times 5^1 \times 5^3}$

$= \frac{875}{10^4} = \boxed{0.0875}$

(iv) $\frac{14588}{625} = \frac{14588}{5^4} = \frac{14588 \times 2^4}{5^4 \times 2^4} = \frac{233408}{10^4} = \boxed{23.3408}$

(v) $\frac{129}{2^2 \times 5^7} = \frac{129 \times 2^5}{2^2 \times 2^5 \times 5^7} = \frac{4128}{10^7} = \boxed{0.0004128}$

Q.3 $\frac{257}{5000}$

2	5000
2	2500
2	1250
5	625
5	125
5	25
5	5
	1

$\frac{257}{5000} = \frac{257}{2^3 \times 5^4} = \frac{257 \times 2^1}{2^3 \times 2^1 \times 5^4}$

$= \frac{514}{10^4} = \boxed{0.0514}$

Q.4(iii) $27.\overline{142857}$

→ As it has a non-terminating repeating decimal expansion, therefore, the prime factorisation of the denominator contains factors other than 2 or 5.

Q.5 327.7081

→ As it has a terminating decimal expansion, therefore, the prime factorisation of the denominator is of the form $2^m \times 5^n$ where m & n are natural no.