X Homework-2

1) Four bells toll at an interval of 8, 12, 15 and 18 seconds respt. All the four begin to toll together. How many times will they toll together in one hour excluding the one at the start?
2) A sweet seller has 420 kaju burfis and 130 badam burfis, she wants to stack them in such a way that each stack has the same number and they take up the least area of the tray. What is the no. of burfis that can be placed in each stack for this purpose?
3) Two tanker contain 850 litres of petrol and 680 l of petrol respt. Find the maximum capacity of a container which can measure the petrol of either tanker in exact number of times.
4) Find the largest number that divides 2053 and 967 and leaves a remainder of 5 and 7 respectively.
5) If two number are divisible only by 3, 5, 15, 25 and 75, then what is their HCF?
6) Three sets of English, Hindi and Mathematics books have to be stacked in such a way that all the books are stored topic-wise and the height of each stack is the same. The number of English books is 96, the number of Hindi books is 240 and the number of Mathematics books is 336. Assuming that the books are of the same thickness, determine the number of stacks of English, Hindi and Mathematics books.
7) The length, breadth and height of a room are 8m 25cm, 6m 75cm and 4m 50cm respectively. Determine the longest rod which can measure the three dimensions of the room exactly.
8) A mason has to fit a bathroom with square marble tiles of the largest possible size. The size of the bathroom is ~~10ft~~ 10m by 8m. What would be the size of the tile required that has to be cut and how many such tiles are required?
9) Find the greatest 6 digit number exactly divisible by 24, 15 and 36.
10) A circular field has a circumference of 360km. Three cyclists start together and can cycle 48, 60 and 72 km a day round the field. When will they meet again?

Homework - 2 Answers

1) $8 = 2^3$

$12 = 2^2 \times 3$

$15 = 3 \times 5$

$18 = 3^2 \times 2$

$LCM(8,12,15,18) = 2^3 \times 3^2 \times 5 = 360$ seconds

$= \frac{360}{60} = 6$ minutes

Hence, the four bells toll together $\frac{60}{6} = 10$ times in one hour.

2) $420 = 2^2 \times 3 \times 5 \times 7$

$130 = 2 \times 5 \times 13$

$HCF(420,130) = 2 \times 5$

$= 10$ burfis in 1 stack.

5 | 420	5 | 130
2 | 84	2 | 26
2 | 42	13
3 | 21	
7	

Hence, no. of burfis in each stack = 10

3) $850 = 2 \times 5^2 \times 17$

$680 = 2^3 \times 5 \times 17$

5 | 850	2 | 680
17 | 170	17 | 340
2 | 10	5 | 20
5	2 | 4
	2

$HCF(850,680) = 2 \times 5 \times 17$

$= 170\ l$

Hence, the required maximum capacity of container = 170 l

4) $2053 - 5 = 2048 = 2^{11}$

$967 - 7 = 960 = 2^6 \times 3 \times 5$

$HCF(2048, 960) = 2^6$

$= 64$

Hence, the required largest number is 64.

2	2048
2	1024
2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
	2

5	960
2	192
2	96
2	48
2	24
2	12
2	6
	3

5) 75

6) $96 = 2^5 \times 3$

$240 = 2^4 \times 3 \times 5$

$336 = 2^4 \times 3 \times 7$

$HCF(96, 240, 336)$

$= 2^4 \times 3$

$= 48$ books in 1 stack

3	96
2	32
2	16
2	8
2	4
	2

5	240
2	48
2	24
2	12
2	6
	3

3	336
2	112
2	56
2	28
2	14
	7

No. of Stacks of English books $= \frac{96}{48}$

$= 2$ Stacks //

No. of Stacks of Hindi books $= \frac{240}{48}$

$= 5$ Stacks //

No. of Stacks of Mathematics books

$= \frac{336}{48} = 7$ Stacks //

7) $8m\,25cm = 825cm = 3 \times 5^2 \times 11$

$6m\,75cm = 675cm = 3^3 \times 5^2$

$4m\,50cm = 450cm = 2 \times 3^2 \times 5^2$

HCF(825, 675, 450)

$= 3 \times 5^2 = 75cm$

5 | 825	5 | 675	5 | 450
5 | 165	5 | 135	5 | 90
3 | 33	3 | 27	3 | 18
11	3 | 9	3 | 6
	3	2

Hence, the required length of the longest rod = 75cm

8) length = 10m = 2×5

breadth = 8m = 2^3

HCF(10, 8) = 2m

Hence, the largest size of tile required

$= 2m \times 2m$

$\therefore$ No. of tiles required $= \frac{\text{area of bathroom}}{\text{area of 1 tile}}$

$= \frac{10 \times 8}{2 \times 2}$

$= 5 \times 4$

$= \underline{20 \text{ tiles}}$

9) Greatest 6 digit number is 999999.

$24 = 2^3 \times 3$

$15 = 3 \times 5$

$36 = 2^2 \times 3^2$

$LCM(24, 15, 36) = 2^3 \times 3^2 \times 5 = 360$

$$
\begin{array}{r}
2777 \\
360\overline{)999999} \\
720 \\
\hline
2799 \\
2520 \\
\hline
2799 \\
2520 \\
\hline
2799 \\
2520 \\
\hline
279
\end{array}
$$

∴ The required greatest number is

$999999 - 279 = \underline{\underline{999720}}$

10) Distance covered by cyclist 1 in 1 day = 48 km

∴ No. of days taken to complete 1 round

$= \frac{360}{48} = \frac{15}{2}$ days

$= \frac{15}{2} \times 24 = \underline{180 \text{ hours}}$

Similarly, for cyclist 2, no. of days taken to complete 1 round

$= \frac{360}{60} = 6 \text{ days} = \underline{144 \text{ hours}}$

and for cyclist 3, no. of days taken to complete 1 round $= \frac{360}{72} = 5 \text{days} = \underline{120 \text{hrs}}$

$180 = 2^2 \times 3^2 \times 5$

$144 = 2^4 \times 3^2$

$120 = 2^3 \times 3 \times 5$

5	180	2	144	2	120
3	36	2	72	2	60
3	12	2	36	2	30
2	4	2	18	3	15
	2	3	9		5
			3		

LCM(180, 144, 120)

$= 2^4 \times 3^2 \times 5$

$= 720$ hours

$= \frac{720}{24} = 30$ days

Hence, the three cyclist will meet again after 30 days
