## DPP – 08
## CLASS – 10th
## TOPIC – EUCLID'S DIVISION ALGORITHM

**Q.1** Express the HCF of 468 and 222 as 468x + 222y where x, y are integers in two different ways.

**Q.2** If the HCF of 408 and 1032 is expressible in the form 1032 m - 408 × 5, find m.

**Q.3** If the HCF of 657 and 963 is expressible in the form 657 x + 963 x - 15, find x.

**Q.4** An army contingent of 616 members is to march behind an army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march?

**Q.5** A merchant has 120 liters of oil of one kind, 180 liters of another kind and 240 liters of third kind. He wants to sell the oil by filling the three kinds of oil in tins of equal capacity. What should be the greatest capacity of such a tin?

**Q.6** During a sale, colour pencils were being sold in packs of 24 each and crayons in packs of 32 each. If you want full packs of both and the same number of pencils and crayons, how many of each would you need to buy?

**Q.7** 144 cartons of Coke Cans and 90 cartons of Pepsi Cans are to be stacked in a Canteen. If each stack is of the same height and is to contain cartons of the same drink, what would be the greatest number of cartons each stack would have?

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**Sol.1** Given integers are 468 and 222 where 468 > 222.
By applying Euclid's division lemma, we get 468 = 222 × 2 + 24 ...(i)
Since remainder ≠ 0, apply division lemma on division 222 and remainder 24
222 = 24 × 9 + 6 ...(ii)
Since remainder ≠ 0, apply division lemma on division 24 and remainder 6
24 = 6 × 4 + 0 ...(iii)
We observe that the remainder = 0, so the last divisor 6 is the HCF of the 468 and 222
From (ii) we have
6 = 222 – 24 × 9
⇒ 6 = 222 – [468 – 222 × 2] × 9 [Substituting 24 = 468 – 222 × 2 from (i)]
⇒ 6 = 222 – 468 × 9 – 222 × 18
⇒ 6 = 222 × 19 – 468 × 9
⇒ 6 = 222y + 468x, where x = –9 and y = 19

**Sol.2** General integers are 408 and 1032 where 408 < 1032
By applying Euclid's division lemma, we get
1032 = 408 × 2 + 216
Since remainder ≠ 0, apply division lemma on division 408 and remainder 216
408 = 216 × 1 + 192
Since remainder ≠ 0, apply division lemma on division 216 and remainder 192
216 = 192 × 1 + 24
Since remainder ≠ 0, apply division lemma on division 192 and remainder 24
192 = 24 × 8 + 32
We observe that 32m under in 0. So the last divisor 24 is the H.C.F of 408 and 1032
∴ 216 = 1032m – 408 × 5
⇒ 1032 m = 24 + 408 × 5
⇒ 1032m = 24 + 2040
⇒ 1032m = 2064
⇒ m = 2064/1032 = 2

**Sol.3** 657 and 963
By applying Euclid's division lemma
963 = 657 × 1 + 306
Since remainder ≠ 0, apply division lemma on division 657 and remainder 306
657 = 306 × 2 + 45
Since remainder ≠ 0, apply division lemma on division 306 and remainder 45
306 = 45 × 6 + 36
Since remainder ≠ 0, apply division lemma on division 45 and remainder 36
45 = 36 × 1 + 19
Since remainder ≠ 0, apply division lemma on division 36 and remainder 19
36 = 19 × 4 + 0

∴ HCF = 657

Given HCF = 657 + 963 × (-15)

⇒ 9 = 657 × −1445

⇒ 9 + 14445 = 657 x

⇒ 657x = 1445y

⇒ x = 1445y/657

⇒ x = 22

**Sol.4** Members in arms = 616

Members in Band = 32

∴ Maximum numbers of columns

= HCF of 616 and 32

By applying Euclid's division lemma

616 = 32 × 19 + 8

32 = 8 × 4 + 0

∴ HCF = 8

Hence the maximum remainder number of columns in which they can each is 8.

**Sol.5** Quantity of oil A = 120 liters

Quantity of oil B = 180 liters

Quantity of oil C = 240 liters

We want to fill oils A, B and C in tins of the same capacity

∴ The greatest capacity of the tin chat can hold oil. A, B and C = HCF of 120, 180 and 240

By fundamental theorem of arithmetic

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

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

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

$HCF = 2^2 \times 3 \times 5 = 4 \times 3 \times 5 = 60$ liters

The greatest capacity of tin = 60 liters

**Sol.6** Number of color pencils in one pack = 24

No of crayons in pack = 32

∴ The least number of both colors to be purchased

= LCM of 24 and 32

= 2 × 2 × 2 × 2 × 3

= 96

∴ Number of packs of pencils to be bought = 96/24 = 4

And number of packs of crayon to be bought = 96/32 = 3

**Sol.7** Number of cartons of coke cans = 144

Number of cartons of pepsi cans = 90

∴ The greatest number of cartons in one stock = HCF of 144 and 90

By applying Euclid's division lemma

144 = 90 × 1 + 54

$90 = 54 \times 1 + 36$

$54 = 36 \times 1 + 18$

$36 = 18 \times 2 + 0$

$\therefore$ HCF = 18

Hence the greatest number cartons in one stock = 18