What could be the maximum value of Y in the following equation given that neither of X, Y, Z is zero? 5X8 + 3Y4 + 2Z1 = 1103

- [ ] 0
- [x] 7
- [x] 8
- [ ] 9

Numbers **Simplification and Approximation**

Discuss it

Question 11-**Explanation:**

```
  1 1    <- CARRY

  5 X 8
+ 3 Y 4
+ 2 Z 1
--------
 11 0 3
--------
```

Clearly, X + Y + Z + 1 = 10 => X + Y + Z = 9 Now, since neither of X, Y, Z can be zero, the value of Y will be maximum when X = Z = 1. => Max Y = 7

Which of the following are prime numbers ?

- [ ] 147
- [ ] 327
- [x] 547
- [ ] 637

Numbers

Discuss it

Question 12-**Explanation:**

(i) 147 $13^2 = 169 > 147$. Prime numbers less than 13 are 2, 3, 5, 7, 11. 147 is divisible by 3. Therefore, 147 is not a prime number. It is a composite number. (ii) 327 $19^2 = 361 > 327$. Prime numbers less than 19 are 2, 3, 5, 7, 11, 13, 17. 327 is divisible by 3. Therefore, 327 is not a prime number. It is a composite number. (iii) 547 $24^2 = 576 > 547$. Prime numbers less than 24 are 2, 3, 5, 7, 11, 13, 17, 19, 23. 547 is not divisible by any of the above prime numbers. Therefore, it is a prime number. (iv) 637 $26^2 = 676 > 637$. Prime numbers less than 26 are 2, 3, 5, 7, 11, 13, 17, 19, 23. 637 is divisible by 7. Therefore, 637 is not a prime number. It is a composite number. Hence, 547 is the only prime number among the given numbers.

What is the unit's digit in the product $(267)^{153} \times (66666)^{72}$?

- [ ] 7
- [ ] 6
- [x] 1
- [x] 2

Numbers Simplification and Approximation

Discuss it

Question 13-**Explanation:**

We have to find the unit digit only.

In 267 unit digit is 7 and cyclicity of 7 is 4.
So, $(267)^{153}$ can be written as $(267)^{Rem(153)/4} = (267)^1$
Unit digit of $(267)^1 = 7$.
similarly for 66666 unit digit is 6 and cyclicity for 6 is 1.
Unit digit for $(66666)^{72} = 6$.

Therefore , Unit digit of the resultant is $7 * 6 = 2$

Question 21

Three friends started running together on a circular track at 8:00:00 am. Time taken by them to complete one round of the track is 15 min, 20 min, 30 min respectively. If they run continuously without any halts, then at what time will they meet again at the starting point for the fourth time ?

- [ ] 8:30:00 am
- [ ] 9:00:00 pm
- [x] 12:00:00 pm
- [x] 12:00:00 am

LCM Numbers

Discuss it

Question 21-Explanation:

LCM (15, 20, 30) = 60 => They meet at the starting point after every 60 min, i.e., after every 1 hour. Therefore, they will meet at the starting point for the fourth time after 4 hours, i.e., at 12:00:00 pm.

The LCM of two co-prime numbers is 117. What is the sum of squares of the numbers ?

- [ ] 220
- [ ] 1530
- [x] 250
- [ ] 22

LCM Numbers

Discuss it

Question 22-**Explanation:**

117 = 3 x 3 x 13 As the numbers are co-prime, HCF = 1. So, the numbers have to be 9 and 13. $9^2 = 81$ $13^2 = 169$ Therefore, required answer = 250

Question 23

HCF of two numbers is 11 and their LCM is 385. If the numbers do not differ by more than 50, what is the sum of the two numbers ?

- [x] 132
- [ ] 35
- [ ] 12
- [ ] 36

Numbers LCM HCF

Discuss it

Question 23-**Explanation:**

Product of numbers = LCM x HCF = 11 x 385 = 4235 Let the numbers be of the form 11m and 11n, such that 'm' and 'n' are co-primes. => 11m x 11n = 4235 => m x n = 35 => (m,n) can be either of (1, 35), (35, 1), (5, 7), (7, 5). => The numbers can be (11, 385), (385, 11), (55, 77), (77, 55). But it is given that the numbers cannot differ by more than 50. Hence, the numbers are 55 and 77. Therefore, sum of the two numbers = 55 + 77 = 132

Question 24

Two numbers are in the ratio of 5:7. If their LCM is 105, what is the difference between their squares ?

- ✓ 216
- ✗ 210
- 72
- 840

Numbers **LCM** **HCF**

Discuss it

Question 24-**Explanation:**

Let 'h' be the HCF of the two numbers. => The numbers are 5h and 7h. We know that Product of Numbers = LCM x HCF => 5h x 7h = 105 x h => h = 3 So, the numbers are 15 and 21. Therefore, difference of their squares = $21^2 - 15^2 = 441 - 225 = 216$

Question 26

Which of the following is the largest of all ? (i) 7/8 (ii) 15/16 (iii) 23/24 (iv) 31/32

- ✗ (i)
- ☐ (ii)
- ☐ (iii)
- ✓ (iv)

Numbers LCM Number Divisibility

Discuss it

Question 26-**Explanation:**

LCM (8, 16, 24, 32) = 96 7/8 = 84/96 15/16 = 90/96 23/24 = 92/96 31/32 = 93/96 Hence, 31/32 is the largest of all.

Given:

Ratio of the numbers = 2 : 3 : 4

Their LCM = 240

To find:

HCF of the numbers

Solution:

Let the first number be = 2x,

Let the second number be = 3x

Let the third number be = 4x,

Now,

Calculating the LCM of 2x, 3x and 4x

= 12x

Since LCM of 240 is given,

Therefore,

12x = 240

x = 240/12

= 20

Answer: H.C.F of the numbers is 20