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Numbers



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Q. 1 $(1^2 + 2^2 + 3^2 + \dots + 10^2) = ?$

- [A] 330
- [B] 345
- [C] 365
- [D] 385

Answer Option [D]

Explanation:

We know that $(1^2 + 2^2 + 3^2 + \dots + n^2) = \frac{1}{6} n(n+1)(2n+1)$

Putting $n = 10$, required sum = $\left(\frac{1}{6} \times 10 \times 11 \times 21 \right) = 385$

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Q. 2 **The sum of first 45 natural numbers is:**

- [A] 1035
- [B] 1280
- [C] 2070
- [D] 2140

Answer Option [A]

Explanation:

Let $S_n = (1 + 2 + 3 + \dots + 45)$. This is an A.P. in which $a = 1$, $d = 1$, $n = 45$.

$$S_n = \frac{n}{2} [2a + (n-1)d] = \frac{45}{2} \times [2 \times 1 + (45-1) \times 1] = \left(\frac{45}{2} \times 46 \right) = (45 \times 23)$$

$$\begin{aligned} &= 45 \times (20 + 3) \\ &= 45 \times 20 + 45 \times 3 \\ &= 900 + 135 \\ &= 1035. \end{aligned}$$

Shortcut Method:

$$S_n = \frac{n(n+1)}{2} = \frac{45(45+1)}{2} = 1035.$$

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Q. 3 **The sum all even natural numbers between 1 and 31 is:**

- [A] 16
- [B] 128
- [C] 240
- [D] 512

Answer Option [C]

Explanation:

Required sum = $(2 + 4 + 6 + \dots + 30)$

This is an A.P. in which $a = 2$, $d = (4 - 2) = 2$ and $l = 30$.

Let the number of terms be n . Then,

$$t_n = 30 \Rightarrow a + (n-1)d = 30$$

$$\Rightarrow 2 + (n-1) \times 2 = 30$$

$$\Rightarrow n - 1 = 14$$

$$\Rightarrow n = 15$$

$$\therefore S_n = \frac{n}{2} (a + l) = \frac{15}{2} \times (2 + 30) = 240.$$

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Q. 4 $\frac{(489 + 375)^2 - (489 - 375)^2}{(489 \times 375)} = ?$

- [A] 144
- [B] 864

- [C] 2
[D] 4
[E] None of these

Answer Option [D]

Explanation:

$$\text{Given Exp.} = \frac{(a+b)^2 - (a-b)^2}{ab} = \frac{4ab}{ab} = 4$$

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Q. 5 The difference between the place values of two sevens in the numeral 69758472 is

- [A] 0
[B] 6993
[C] 699930
[D] None of these

Answer Option [C]

Explanation: Required difference = (700000 - 70) = 699930

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Q. 6 n is a whole number which when divided by 4 gives 3 as remainder. What will be the remainder when $2n$ is divided by 4 ?

- [A] 3
[B] 2
[C] 1
[D] 0

Answer Option [B]

Explanation:

Let $n = 4q + 3$. Then $2n = 8q + 6 = 4(2q + 1) + 2$.
Thus, when $2n$ is divided by 4, the remainder is 2.

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Q. 7 If 60% of $\frac{3}{5}$ of a number is 36, then the number is:

- [A] 80
[B] 100
[C] 75
[D] 90

Answer Option [B]

Explanation:

Let the number be x . Then

$$60\% \text{ of } \frac{3}{5} \text{ of } x = 36$$

$$\Rightarrow \frac{60}{100} \times \frac{3}{5} \times x = 36$$

$$\Rightarrow x = \left(36 \times \frac{25}{9} \right) = 100$$

\therefore Required number = 100

Q. 8 **$287 \times 287 + 269 \times 269 - 2 \times 287 \times 269 = ?$**

- [A] 534
- [B] 446
- [C] 354
- [D] 324
- [E] None of these

Answer Option [D]

Explanation:

Given Exp. $= a^2 + b^2 - 2ab$, where $a = 287$ and $b = 269$

$$= (a - b)^2 = (287 - 269)^2$$

$$= (18^2)$$

$$= 324$$

Q. 9 **$(?) - 19657 - 33994 = 9999$**

- [A] 63650
- [B] 53760
- [C] 59640
- [D] 61560
- [E] None of these

Answer Option [A]

Explanation:

$$19657 \quad \text{Let } x - 53651 = 9999 - 33994 \quad \text{Then, } x = 9999 + 53651 = 63650 \quad \text{-----} \quad 53651 \quad \text{-----}$$

Q. 10 **The difference of two numbers is 1365. On dividing the larger number by the smaller, we get 6 as quotient and the 15 as remainder. What is the smaller number ?**

- [A] 240
- [B] 270
- [C] 295
- [D] 360

Answer Option [B]

Explanation:

Let the smaller number be x . Then larger number $= (x + 1365)$.

$$\therefore x + 1365 = 6x + 15$$

$$\Rightarrow 5x = 1350$$

$$\Rightarrow x = 270$$

\therefore Smaller number $= 270$.

Q. 11 **$(51 + 52 + 53 + \dots + 100) = ?$**

- [A] 2525
- [B] 2975
- [C] 3225
- [D] 3775

Answer Option [D]

Explanation:

$$\begin{aligned} S_n &= (1 + 2 + 3 + \dots + 50 + 51 + 52 + \dots + 100) - (1 + 2 + 3 + \dots + 50) \\ &= \frac{100}{2} \times (1 + 100) - \frac{50}{2} \times (1 + 50) \\ &= (50 \times 101) - (25 \times 51) \\ &= (5050 - 1275) \\ &= 3775. \end{aligned}$$

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Q. 12 The sum of all two digit numbers divisible by 5 is:

- [A] 1035
- [B] 1245
- [C] 1230
- [D] 945
- [E] None of these

Answer Option [D]

Explanation:

Required numbers are 10, 15, 20, 25, ..., 95
This is an A.P. in which $a = 10$, $d = 5$ and $l = 95$.
 $t_n = 95 \Rightarrow a + (n - 1)d = 95$
 $\Rightarrow 10 + (n - 1) \times 5 = 95$
 $\Rightarrow (n - 1) \times 5 = 85$
 $\Rightarrow (n - 1) = 17$
 $\Rightarrow n = 18$

$$\therefore \text{Required Sum} = \frac{n}{2} (a + l) = \frac{18}{2} \times (10 + 95) = (9 \times 105) = 945.$$

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Q. 13 $\left(1 - \frac{1}{1}\right)^n + \left(1 - \frac{1}{2}\right)^n + \left(1 - \frac{1}{3}\right)^n + \dots$ up to n terms = ?

- [A] $\frac{1}{2^n}$
- [B] $\frac{1}{2^{n-1}}$
- [C] $\frac{1}{2^{n(n-1)}}$
- [D] None of these

Answer Option [B]

Explanation:

$$\begin{aligned} \text{Given sum} &= (1 + 1 + 1 + \dots \text{ to } n \text{ terms}) - \left(\frac{1}{n} + \frac{2}{n} + \frac{3}{n} + \dots \text{ to } n \text{ terms}\right) \\ &= n - \frac{n}{2} \left(\frac{1}{n} + 1\right) \quad [\text{Ref: } n\text{th terms} = (n/n) = 1] \\ &= n - \frac{n+1}{2} \\ &= \frac{1}{2} (n - 1) \end{aligned}$$

Q. 14 Which one of the following numbers is exactly divisible by 11?

- [A] 235641
- [B] 245642
- [C] 315624
- [D] 415624

Answer Option [D]

Explanation:

$(4 + 5 + 2) - (1 + 6 + 3) = 1$, not divisible by 11.
 $(2 + 6 + 4) - (4 + 5 + 2) = 1$, not divisible by 11.
 $(4 + 6 + 1) - (2 + 5 + 3) = 1$, not divisible by 11.
 $(4 + 6 + 1) - (2 + 5 + 4) = 0$, So, 415624 is divisible by 11.

Q. 15 $9548 + 7314 = 8362 + (?)$

- [A] 8230
- [B] 8410
- [C] 8500
- [D] 8600
- [E] None of these

Answer Option [C]

Explanation:

$$9548 \quad 16862 = 8362 + x \quad + 7314 \quad x = 16862 - 8362 \quad = 8500 \quad 16862$$

Q. 16 $\frac{(963 + 476)^2 + (963 - 476)^2}{(963 \times 963 + 476 \times 476)} = ?$

- [A] 1449
- [B] 497
- [C] 2
- [D] 4
- [E] None of these

Answer Option [C]

Explanation:

$$\text{Given Exp.} = \frac{(a + b)^2 + (a - b)^2}{(a^2 + b^2)} = \frac{2(a^2 + b^2)}{(a^2 + b^2)} = 2$$

Q. 17 $8796 \times 223 + 8796 \times 77 = ?$

- [A] 2736900
- [B] 2638800
- [C] 2658560
- [D] 2716740

[E] None of these

Answer Option [B]

Explanation:

$$\begin{aligned}8796 \times 223 + 8796 \times 77 &= 8796 \times (223 + 77) \quad [\text{Ref: By Distributive Law}] \\ &= (8796 \times 300) \\ &= 2638800\end{aligned}$$

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Q. 18 Which one of the following can't be the square of natural number ?

- [A] 30976
- [B] 75625
- [C] 28561
- [D] 143642
- [E] None of these

Answer Option [D]

Explanation:

The square of a natural number never ends in 2.
∴ 143642 is not the square of natural number.

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Q. 19 $397 \times 397 + 104 \times 104 + 2 \times 397 \times 104 = ?$

- [A] 250001
- [B] 251001
- [C] 260101
- [D] 261001

Answer Option [B]

Explanation:

$$\begin{aligned}\text{Given Exp.} &= (397)^2 + (104)^2 + 2 \times 397 \times 104 \\ &= (397 + 104)^2 \\ &= (501)^2 = (500 + 1)^2 \\ &= (500^2) + (1)^2 + (2 \times 500 \times 1) \\ &= 250000 + 1 + 1000 \\ &= 251001\end{aligned}$$

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Q. 20 In a division sum, the divisor is 10 times the quotient and 5 times the remainder. If the remainder is 46, what is the dividend ?

- [A] 4236
- [B] 4306
- [C] 4336
- [D] 5336
- [E] None of these

Answer Option [D]

Explanation:

$$\begin{aligned}\text{Divisor} &= (5 \times 46) = 230 \\ \therefore 10 \times \text{Quotient} &= 230 \Rightarrow \frac{230}{10} = 23\end{aligned}$$

$$\begin{aligned} \text{Dividend} &= (\text{Divisor} \times \text{Quotient}) + \text{Remainder} \\ &= (230 \times 23) + 46 \\ &= 5290 + 46 \\ &= 5336. \end{aligned}$$

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Q. 21 $(11^2 + 12^2 + 13^2 + \dots + 20^2) = ?$

- [A] 385
- [B] 2485
- [C] 2870
- [D] 3255

Answer Option [B]

Explanation:

$$(11^2 + 12^2 + 13^2 + \dots + 20^2) = (1^2 + 2^2 + 3^2 + \dots + 20^2) - (1^2 + 2^2 + 3^2 + \dots + 10^2)$$

$$\left[\text{Ref: } (1^2 + 2^2 + 3^2 + \dots + n^2) = \frac{1}{6} n(n+1)(2n+1) \right]$$

$$\begin{aligned} &= (2870 - 385) \\ &= 2485. \end{aligned}$$

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Q. 22 $72519 \times 9999 = ?$

- [A] 725117481
- [B] 674217481
- [C] 685126481
- [D] 696217481
- [E] None of these

Answer Option [A]

Explanation:

$$\begin{aligned} 72519 \times 9999 &= 72519 \times (10000 - 1) \\ &= 72519 \times 10000 - 72519 \times 1 \\ &= 725190000 - 72519 \\ &= 725117481. \end{aligned}$$

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Q. 23 Which one of the following is a prime number ?

- [A] 119
- [B] 187
- [C] 247
- [D] 551
- [E] None of these

Answer Option [E]

Explanation:

$$551 > 22$$

All prime numbers less than 24 are : 2, 3, 5, 7, 11, 13, 17, 19, 23.

119 is divisible by 7; 187 is divisible by 11; 247 is divisible by 13 and 551 is divisible by 19.

So, none of the given numbers is prime.

Q. 24 $(2^2 + 4^2 + 6^2 + \dots + 20^2) = ?$

- [A] 770
- [B] 1155
- [C] 1540
- [D] 385×385

Answer Option [C]

Explanation:

$$\begin{aligned} (2^2 + 4^2 + 6^2 + \dots + 20^2) &= (1 \times 2)^2 + (2 \times 2)^2 + (2 \times 3)^2 + \dots + (2 \times 10)^2 \\ &= (2^2 \times 1^2) + (2^2 \times 2^2) + (2^2 \times 3^2) + \dots + (2^2 \times 10^2) \\ &= 2^2 \times [1^2 + 2^2 + 3^2 + \dots + 10^2] \end{aligned}$$

$$\left[\text{Ref: } (1^2 + 2^2 + 3^2 + \dots + n^2) = \frac{1}{6} n(n+1)(2n+1) \right]$$

$$= \left(4 \times \frac{1}{6} \times 10 \times 11 \times 21 \right)$$

$$\begin{aligned} &= (4 \times 5 \times 77) \\ &= 1540. \end{aligned}$$

Q. 25 A number when divided successively by 4 and 5 leaves remainders 1 and 4 respectively. When it is successively divided by 5 and 4, the

- [A] 1, 2
- [B] 2, 3
- [C] 3, 2
- [D] 4, 1

Answer Option [B]

Explanation:

$$4 \mid x \qquad y = (5 \times 1 + 4) = 9 \qquad 5 \mid y - 1 \qquad x = (4 \times y + 1) = (4 \times 9 + 1) = 37 \qquad 1 \mid -4 \qquad \text{Now, } 37 \div 4 = 9 \text{ R } 1$$

Q. 26 If the product $4864 \times 9P2$ is divisible by 12, then the value of P is:

- [A] 2
- [B] 5
- [C] 6
- [D] 8
- [E] None of these

Answer Option [E]

Explanation:

Clearly, 4864 is divisible by 4.
So, $9P2$ must be divisible by 3. So, $(9 + P + 2)$ must be divisible by 3.
 $\therefore P = 1$.

Q. 27 How many natural numbers are there between 23 and 100 which are exactly divisible by 6 ?

- [A] 8
- [B] 11
- [C] 12
- [D] 13

[E] None of these

Answer Option [D]

Explanation:

Required numbers are 24, 30, 36, 42, ..., 96

This is an A.P. in which $a = 24$, $d = 6$ and $l = 96$

Let the number of terms in it be n .

Then $t_n = 96 \Rightarrow a + (n - 1)d = 96$

$\Rightarrow 24 + (n - 1) \times 6 = 96$

$\Rightarrow (n - 1) \times 6 = 72$

$\Rightarrow (n - 1) = 12$

$\Rightarrow n = 13$

Required number of numbers = 13.

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Q. 28 **What least number must be added to 1056, so that the sum is completely divisible by 23 ?**

[A] 2

[B] 3

[C] 18

[D] 21

[E] None of these

Answer Option [A]

Explanation:

23) 1056 (45 92 --- 136 115 --- 21 --- Required number = (23 - 21)

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Q. 29 **How many 3 digit numbers are divisible by 6 in all ?**

[A] 149

[B] 150

[C] 151

[D] 166

Answer Option [B]

Explanation:

Required numbers are 102, 108, 114, ..., 996

This is an A.P. in which $a = 102$, $d = 6$ and $l = 996$

Let the number of terms be n . Then,

$a + (n - 1)d = 996$

$\Rightarrow 102 + (n - 1) \times 6 = 996$

$\Rightarrow 6 \times (n - 1) = 894$

$\Rightarrow (n - 1) = 149$

$\Rightarrow n = 150$.

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Q. 30 **2056 x 987 = ?**

[A] 1936372

[B] 2029272

[C] 1896172

[D] 1926172

[E] None of these

Answer Option [B]

Explanation:

$2056 \times 987 = 2056 \times (1000 - 13)$

$= 2056 \times 1000 - 2056 \times 13$

$= 2056000 - 26728$

Q. 31 Which of the following numbers will completely divide $(4^{61} + 4^{62} + 4^{63} + 4^{64})$?

- [A] 3
 [B] 10
 [C] 11
 [D] 13

Answer Option [B]

Explanation:

$$\begin{aligned} (4^{61} + 4^{62} + 4^{63} + 4^{64}) &= 4^{61} \times (1 + 4 + 4^2 + 4^3) = 4^{61} \times 85 \\ &= 4^{60} \times (4 \times 85) \\ &= (4^{60} \times 340), \text{ which is divisible by } 10. \end{aligned}$$

Q. 32 The difference between a positive proper fraction and its reciprocal is $\frac{9}{20}$. The fraction is:

- [A] $\frac{3}{5}$
 [B] $\frac{3}{10}$
 [C] $\frac{4}{5}$
 [D] $\frac{4}{3}$

Answer Option [C]

Explanation:

Let the required fraction be x . Then $\frac{1}{x} - x = \frac{9}{20}$

$$\therefore \frac{1 - x^2}{x} = \frac{9}{20}$$

$$\begin{aligned} \Rightarrow 20 - 20x^2 &= 9x \\ \Rightarrow 20x^2 + 9x - 20 &= 0 \\ \Rightarrow 20x^2 + 25x - 16x - 20 &= 0 \\ \Rightarrow 5x(4x + 5) - 4(4x + 5) &= 0 \\ \Rightarrow (4x + 5)(5x - 4) &= 0 \\ x &= \frac{4}{5} \end{aligned}$$

Q. 33 If the number $481 * 673$ is completely divisible by 9, then the smallest whole number in place of * will be:

- [A] 2
 [B] 5
 [C] 6
 [D] 7
 [E] None of these

Answer Option [D]

Explanation:

Sum of digits = $(4 + 8 + 1 + x + 6 + 7 + 3) = (29 + x)$, which must be divisible by 9.
 $\therefore x = 7$.

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Q. 34 Which natural number is nearest to 9217, which is completely divisible by 88 ?

- [A] 9152
- [B] 9240
- [C] 9064
- [D] 9184
- [E] None of these

Answer Option [B]

Explanation:

On dividing we get, $88 \overline{) 9217} (104 \quad 88 \quad \text{----} \quad 417 \quad 352 \quad \text{----} \quad 65 \quad \text{----}$ Therefore, Required n

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Q. 35 If $(64)^2 - (36)^2 = 20 \times x$, then $x = ?$

- [A] 70
- [B] 120
- [C] 180
- [D] 140
- [E] None of these

Answer Option [D]

Explanation:

$20 \times x = (64 + 36)(64 - 36) = 100 \times 28$
 $\Rightarrow x = \frac{100 \times 28}{20} = 140$

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Q. 36 When a number is divided by 13, the remainder is 11. When the same number is divided by 17, then remainder is 9. What is the number ?

- [A] 339
- [B] 349
- [C] 369
- [D] Data inadequate

Answer Option [B]

Explanation:

$x = 13p + 11$ and $x = 17q + 9$
 $\therefore 13p + 11 = 17q + 9$
 $\Rightarrow 17q - 13p = 2$
 $\Rightarrow q = \frac{2 + 13p}{17}$

The least value of p for which $q = \frac{2 + 13p}{17}$ is a whole number is $p = 26$

$\therefore x = (13 \times 26 + 11)$
 $= (338 + 11)$
 $= 349$

Q. 37 (35423 + 7164 + 41720) - (317 x 89) = ?

- [A] 28213
- [B] 84307
- [C] 50694
- [D] 56094
- [E] None of these

Answer Option [D]

Explanation:

$$35423 + 7164 + 41720 - (317 \times 89) = 35423 + 7164 + 41720 - (317 \times 90 - 317) = (28530 - 317)$$

Q. 38 476 ** 0 is divisible by both 3 and 11. The non-zero digits in the hundred's and ten's places are respectively:

- [A] 7 and 4
- [B] 7 and 5
- [C] 8 and 5
- [D] None of these

Answer Option [C]

Explanation:

Let the given number be 476 xy 0.
 Then $(4 + 7 + 6 + x + y + 0) = (17 + x + y)$ must be divisible by 3.
 And, $(0 + x + 7) - (y + 6 + 4) = (x - y - 3)$ must be either 0 or 11.
 $x - y - 3 = 0 \Rightarrow y = x - 3$
 $(17 + x + y) = (17 + x + x - 3) = (2x + 14)$
 $\Rightarrow x = 2$ or $x = 8$.
 $\therefore x = 8$ and $y = 5$.

Q. 39 $\frac{768 \times 768 \times 768 + 232 \times 232 \times 232}{768 \times 768 - 768 \times 232 + 232 \times 232} = ?$

- [A] 1000
- [B] 536
- [C] 500
- [D] 268
- [E] None of these

Answer Option [A]

Explanation:

Given Exp. = $\frac{(a^3 + b^3)}{(a^2 - ab + b^2)} = (a + b) = (768 + 232) = 1000$

Q. 40 It is being given that $(2^{32} + 1)$ is completely divisible by a whole number. Which of the following numbers is completely divisible by this number?

- [A] $(2^{16} + 1)$
- [B] $(2^{16} - 1)$
- [C] (7×2^{23})
- [D] $(2^{96} + 1)$

Answer Option [D]

Explanation:

Let $2^{32} = x$. Then, $(2^{32} + 1) = (x + 1)$.

Let $(x + 1)$ be completely divisible by the natural number N . Then,

$(2^{96} + 1) = [(2^{32})^3 + 1] = (x^3 + 1) = (x + 1)(x^2 - x + 1)$, which is completely divisible by N , since $(x + 1)$ is divisible by N .

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Q. 41 Which of the following numbers is divisible by each one of 3, 7, 9 and 11 ?

- [A] 639
- [B] 2079
- [C] 3791
- [D] 37911
- [E] None of these

Answer Option [B]

Explanation:

639 is not divisible by 7

2079 is divisible by each of 3, 7, 9, 11.

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Q. 42 $35 + 15 \times 1.5 = ?$

- [A] 85
- [B] 51.5
- [C] 57.5
- [D] 5.25
- [E] None of these

Answer Option [C]

Explanation:

$$\text{Given Exp.} = 35 + 15 \times \frac{3}{2} = 35 + \frac{45}{2} = 35 + 22.5 = 57.5$$

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Q. 43 If n is a natural number, then $(6n^2 + 6n)$ is always divisible by:

- [A] 6 only
- [B] 6 and 12 both
- [C] 12 only
- [D] by 18 only

Answer Option [B]

Explanation:

$(6n^2 + 6n) = 6n(n + 1)$, which is always divisible by 6 and 12 both, since $n(n + 1)$ is always even.

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Q. 44 On dividing a number by 5, we get 3 as remainder. What will the remainder when the square of the this number is divided by 5 ?

- [A] 0
- [B] 1
- [C] 2
- [D] 4

Answer Option [D]

Explanation:

Let the number be x and on dividing x by 5, we get k as quotient and 3 as remainder.

$$\therefore x = 5k + 3$$

$$\Rightarrow x^2 = (5k + 3)^2$$

$$= (25k^2 + 30k + 9)$$

$$= 5(5k^2 + 6k + 1) + 4$$

\therefore On dividing x^2 by 5, we get 4 as remainder.

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Q. 45 A number when divide by 6 leaves a remainder 3. When the square of the number is divided by 6, the remainder is:

[A] 0

[B] 1

[C] 2

[D] 3

Answer Option [D]

Explanation:

Let $x = 6q + 3$.

$$\text{Then, } x^2 = (6q + 3)^2$$

$$= 36q^2 + 36q + 9$$

$$= 6(6q^2 + 6q + 1) + 3$$

Thus, when x^2 is divided by 6, then remainder = 3.

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Q. 46 What is the unit digit in $(4137)^{754}$?

[A] 1

[B] 3

[C] 7

[D] 9

Answer Option [D]

Explanation:

Unit digit in $(4137)^{754} = \text{Unit digit in } \{(4137)^4\}^{188} \times (4137)^2$

$= \text{Unit digit in } \{292915317923361 \times 17114769\}$

$= (1 \times 9) = 9$

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Q. 47 Which one of the following is a prime number ?

[A] 161

[B] 221

[C] 373

[D] 437

[E] None of these

Answer Option [C]

Explanation:

$437 > 22$

All prime numbers less than 22 are : 2, 3, 5, 7, 11, 13, 17, 19.

161 is divisible by 7, and 221 is divisible by 13.

373 is not divisible by any of the above prime numbers.

\therefore 373 is prime.

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Q. 48 The unit digit in the product $(784 \times 618 \times 917 \times 463)$ is:

[A] 2

[B] 3

[C] 4

[D] 5

Answer Option [A]

Explanation: Unit digit in the given product = Unit digit in $(4 \times 8 \times 7 \times 3) = (672) = 2$

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Q. 49 **$-84 \times 29 + 365 = ?$**

[A] 2436

[B] 2801

[C] -2801

[D] -2071

[E] None of these

Answer Option [D]

Explanation:

$$\begin{aligned} \text{Given Exp.} &= -84 \times (30 - 1) + 365 \\ &= -(84 \times 30) + 84 + 365 \\ &= -2520 + 449 \\ &= -2071 \end{aligned}$$

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Q. 50 **$2 + 2^2 + 2^3 + \dots + 2^9 = ?$**

[A] 2044

[B] 1022

[C] 1056

[D] None of these

Answer Option [B]

Explanation:

This is a G.P. in which $a = 2$, $r = \frac{2^2}{2} = 2$ and $n = 9$.

$$\therefore S_n = \frac{a(r^n - 1)}{(r - 1)} = \frac{2 \times (2^9 - 1)}{(2 - 1)} = 2 \times (512 - 1) = 2 \times 511 = 1022.$$

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Q. 51 **$5358 \times 51 = ?$**

[A] 273258

[B] 273268

[C] 273348

[D] 273358

Answer Option [A]

Explanation:

$$\begin{aligned} 5358 \times 51 &= 5358 \times (50 + 1) \\ &= 5358 \times 50 + 5358 \times 1 \\ &= 267900 + 5358 \end{aligned}$$

Q. 52 What will be remainder when 17^{200} is divided by 18 ?

- [A] 17
[B] 16
[C] 1
[D] 2

Answer Option [C]

Explanation:

When n is even, $(x^n - a^n)$ is completely divisibly by $(x + a)$

$(17^{200} - 1^{200})$ is completely divisible by $(17 + 1)$, i.e., 18.

$\Rightarrow (17^{200} - 1)$ is completely divisible by 18.

\Rightarrow On dividing 17^{200} by 18, we get 1 as remainder.

Q. 53 The sum of first 45 natural numbers is:

- [A] 1035
[B] 1280
[C] 2070
[D] 2140

Answer Option [A]

Explanation:

Let $S_n = (1 + 2 + 3 + \dots + 45)$

This is an A.P. in which $a = 1$, $d = 1$, $n = 45$ and $l = 45$

$$\therefore S_n = \frac{n}{2} (a + l) = \frac{45}{2} \times (1 + 45) = (45 \times 23) = 1035$$

Required sum = 1035.

Q. 54 $587 \times 999 = ?$

- [A] 586413
[B] 587523
[C] 614823
[D] 615173

Answer Option [A]

Explanation:

$$587 \times 999 = 587 \times (1000 - 1)$$

$$= 587 \times 1000 - 587 \times 1$$

$$= 587000 - 587$$

$$= 586413.$$

Q. 55 The sum of the two numbers is 12 and their product is 35. What is the sum of the reciprocals of these numbers ?

- [A] $\frac{12}{35}$

[B] $\frac{1}{35}$

[C] $\frac{35}{8}$

[D] $\frac{7}{32}$

Answer Option [A]

Explanation:

Let the numbers be a and b . Then, $a + b = 12$ and $ab = 35$.

$$\therefore \frac{a+b}{ab} = \frac{12}{35} \Rightarrow \left(\frac{1}{b} + \frac{1}{a} \right) = \frac{12}{35}$$

$$\therefore \text{Sum of reciprocals of given numbers} = \frac{12}{35}$$

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Q. 56 (12345679 x 72) = ?

[A] 88888888

[B] 888888888

[C] 898989898

[D] 999999998

Answer Option [B]

Explanation:

$$\begin{aligned} 12345679 \times 72 &= 12345679 \times (70 + 2) \\ &= 12345679 \times 70 + 12345679 \times 2 \\ &= 864197530 + 24691358 \\ &= 888888888 \end{aligned}$$

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Q. 57 Which of the following number is divisible by 24 ?

[A] 35718

[B] 63810

[C] 537804

[D] 3125736

Answer Option [D]

Explanation:

$24 = 3 \times 8$, where 3 and 8 co-prime.
Clearly, 35718 is not divisible by 8, as 718 is not divisible by 8.
Similarly, 63810 is not divisible by 8 and 537804 is not divisible by 8.
Consider part (d).
Sum of digits = $(3 + 1 + 2 + 5 + 7 + 3 + 6) = 27$, which is divisible by 3.
Also, 736 is divisible by 8.
 $\therefore 3125736$ is divisible by (3×8) , i.e., 24.

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Q. 58 8597 - ? = 7429 - 4358

[A] 5426

- [B] 5706
- [C] 5526
- [D] 5476
- [E] None of these

Answer Option [C]

Explanation:

$$7429 \quad \text{Let } 8597 - x = 3071 \quad -4358 \quad \text{Then,} \quad x = 8597 - 3071 \quad \text{----} \quad = 5526 \quad 3071 \quad \text{----}$$

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Q. 59 $\frac{753 \times 753 + 247 \times 247 - 753 \times 247}{753 \times 753 \times 753 + 247 \times 247 \times 247} = ?$

[A] $\frac{1}{1000}$

[B] $\frac{1}{506}$

[C] $\frac{253}{500}$

[D] None of these

Answer Option [A]

Explanation:

$$\text{Given Exp.} = \frac{(a^2 + b^2 - ab)}{(a^3 + b^3)} = \frac{1}{(a + b)} = \frac{1}{(753 + 247)} = \frac{1}{1000}$$

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Q. 60 $(x^n - a^n)$ is completely divisible by $(x - a)$, when

- [A] n is any natural number
- [B] n is an even natural number
- [C] n is and odd natural number
- [D] n is prime

Answer Option [A]

Explanation:

For every natural number n , $(x^n - a^n)$ is completely divisible by $(x - a)$.

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Q. 61 Which one of the following numbers is completely divisible by 99?

- [A] 3572404
- [B] 135792
- [C] 913464
- [D] 114345
- [E] None of these

Answer Option [D]

Explanation:

99 = 11 x 9, where 11 and 9 are co-prime.

By hit and trial, we find that 114345 is divisible by 11 as well as 9. So, it is divisible by 99.

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Q. 62 $\frac{854 \times 854 \times 854 - 276 \times 276 \times 276}{854 \times 854 + 854 \times 276 + 276 \times 276} = ?$

- [A] 1130
- [B] 578
- [C] 565
- [D] 1156
- [E] None of these

Answer Option [B]

Explanation:

$$\text{Given Exp.} = \frac{(a^3 - b^3)}{(a^2 + ab + b^2)} = (a - b) = (854 - 276) = 578$$

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Q. 63 **What is the unit digit in the product ($3^{65} \times 6^{59} \times 7^{71}$)?**

- [A] 1
- [B] 2
- [C] 4
- [D] 6

Answer Option [C]

Explanation:

Unit digit in $3^4 = 1 \Rightarrow$ Unit digit in $(3^4)^{16} = 1$
 \therefore Unit digit in $3^{65} =$ Unit digit in $[(3^4)^{16} \times 3] = (1 \times 3) = 3$
Unit digit in $6^{59} = 6$
Unit digit in $7^4 \Rightarrow$ Unit digit in $(7^4)^{17}$ is 1.
Unit digit in $7^{71} =$ Unit digit in $[(7^4)^{17} \times 7^3] = (1 \times 3) = 3$
 \therefore Required digit = Unit digit in $(3 \times 6 \times 3) = 4$.

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Q. 64 **If a and b are odd numbers, then which of the following is even ?**

- [A] $a + b$
- [B] $a + b + 1$
- [C] ab
- [D] $ab + 2$
- [E] None of these

Answer Option [A]

Explanation: The sum of two odd number is even. So, $a + b$ is even.

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Q. 65 **What smallest number should be added to 4456 so that the sum is completely divisible by 6 ?**

- [A] 4
- [B] 3
- [C] 2
- [D] 1
- [E] None of these

Answer Option [C]

Explanation:

6) 4456 (742

42

25

24

Therefore, Required number = $(6 - 4) = 2$.

16

12

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Q. 66 Which of the following numbers will completely divide $(49^{15} - 1)$?

[A] 8

[B] 14

[C] 46

[D] 50

Answer Option [A]

Explanation:

$(x^n - 1)$ will be divisibly by $(x + 1)$ only when n is even.

$(49^{15} - 1) = \{(7^2)^{15} - 1\} = (7^{30} - 1)$, which is divisible by $(7 + 1)$, i.e., 8.

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Q. 67 How many of the following numbers are divisible by 3 but not by 9 ?
2133, 2343, 3474, 4131, 5286, 5340, 6336, 7347, 8115, 9276

[A] 5

[B] 6

[C] 7

[D] None of these

Answer Option [B]

Explanation:

Marking (/) those which are are divisible by 3 by not by 9 and the others by (X), by taking the sum of digits, we get:s

2133 \rightarrow 9 (X)

2343 \rightarrow 12 (/)

3474 \rightarrow 18 (X)

4131 \rightarrow 9 (X)

5286 \rightarrow 21 (/)

5340 \rightarrow 12 (/)

6336 \rightarrow 18 (X)

7347 \rightarrow 21 (/)

8115 \rightarrow 15 (/)

9276 \rightarrow 24 (/)

Required number of numbers = 6.

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Q. 68 If the number $5 * 2$ is divisible by 6, then $* = ?$

[A] 2

[B] 3

[C] 6

[D] 7

Answer Option [A]

Explanation:

$6 = 3 \times 2$. Clearly, $5 * 2$ is divisible by 2. Replace $*$ by x .

Then, $(5 + x + 2)$ must be divisible by 3. So, $x = 2$.

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Q. 69 Which of the following is a prime number ?

[A] 33

[B] 81

[C] 93

[D] 97

Answer Option [D]

Explanation: Clearly, 97 is a prime number.

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Q. 70 **The smallest 5 digit number exactly divisible by 41 is:**

[A] 1004

[B] 10004

[C] 10045

[D] 10025

[E] None of these

Answer Option [B]

Explanation:

The smallest 5-digit number = 10000. 41) 10000 (243 82 --- 180 164 ---- 160 123 ---

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Q. 71 **How many 3-digit numbers are completely divisible 6 ?**

[A] 149

[B] 150

[C] 151

[D] 166

Answer Option [B]

Explanation:

3-digit number divisible by 6 are: 102, 108, 114, ..., 996

This is an A.P. in which $a = 102$, $d = 6$ and $l = 996$

Let the number of terms be n . Then $t_n = 996$.

$$\therefore a + (n - 1)d = 996$$

$$\Rightarrow 102 + (n - 1) \times 6 = 996$$

$$\Rightarrow 6 \times (n - 1) = 894$$

$$\Rightarrow (n - 1) = 149$$

$$\Rightarrow n = 150$$

$$\therefore \text{Number of terms} = 150.$$

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Q. 72 **The smallest 3 digit prime number is:**

[A] 101

[B] 103

[C] 109

[D] 113

Answer Option [A]

Explanation:

The smallest 3-digit number is 100, which is divisible by 2.

\therefore 100 is not a prime number.

$101 < 11$ and 101 is not divisible by any of the prime numbers 2, 3, 5, 7, 11.

\therefore 101 is a prime number.

Hence 101 is the smallest 3-digit prime number.

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Q. 73 **Which one of the following is not a prime number?**

[A] 31

- [B] 61
- [C] 71
- [D] 91

Answer Option [D]

Explanation: 91 is divisible by 7. So, it is not a prime number.

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Q. 74 **8988 ? 8 ? 4 = ?**

- [A] 4494
- [B] 561.75
- [C] 2247
- [D] 280.875
- [E] None of these

Answer Option [D]

Explanation:

$$\text{Given Exp.} = 8988 \times \frac{1}{8} \times \frac{1}{4} = \frac{2247}{8} = 280.875$$

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Q. 75 **A number was divided successively in order by 4, 5 and 6. The remainders were respectively 2, 3 and 4. The number is:**

- [A] 214
- [B] 476
- [C] 954
- [D] 1908

Answer Option [A]

Explanation:

$$4 \mid x \quad z = 6 \times x + 4 = 10 \quad \text{-----} \quad 5 \mid y - 2 \quad y = 5 \times z + 3 = 5 \times 10 + 3 = 53 \quad \text{-----} \quad 6 \mid z - 3$$

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Q. 76 **A 3-digit number $4a3$ is added to another 3-digit number 984 to give a 4-digit number $13b7$, which is divisible by 11. Then, $(a + b) = ?$**

- [A] 10
- [B] 11
- [C] 12
- [D] 15

Answer Option [A]

Explanation:

$$4a3 \mid 984 \} \implies a + 8 = b \implies b - a = 8 \quad 13b7 \mid$$

Also, $13b7$ is divisible by 11 $\implies (7 + 3) - (b + 1) = (9 - b)$
 $\implies (9 - b) = 0$
 $\implies b = 9$
 $\therefore (b = 9 \text{ and } a = 1) \implies (a + b) = 10.$

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Q. 77 **How many terms are there in the G.P. 3, 6, 12, 24, ..., 384 ?**

- [A] 8

- [B] 9
- [C] 10
- [D] 11
- [E] 7

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Answer Option [A]

Explanation:

Here $a = 3$ and $r = \frac{6}{3} = 2$. Let the number of terms be n .

Then, $t_n = 384 \Rightarrow ar^{n-1} = 384$
 $\Rightarrow 3 \times 2^{n-1} = 384$
 $\Rightarrow 2^{n-1} = 128 = 2^7$
 $\Rightarrow n - 1 = 7$
 $\Rightarrow n = 8$
 \therefore Number of terms = 8.

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Q. 78 On dividing 2272 as well as 875 by 3-digit number N, we get the same remainder. The sum of the digits of N is:

- [A] 10
- [B] 11
- [C] 12
- [D] 13

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Answer Option [A]

Explanation:

Clearly, $(2272 - 875) = 1397$, is exactly divisible by N.
 Now, $1397 = 11 \times 127$
 \therefore The required 3-digit number is 127, the sum of whose digits is 10.

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Q. 79 (935421 x 625) = ?

- [A] 575648125
- [B] 584638125
- [C] 584649125
- [D] 585628125

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Answer Option [B]

Explanation:

$$935421 \times 625 = 935421 \times 5^4 = 935421 \times \left(\frac{10}{2}\right)^4$$

$$= \frac{935421 \times 10^4}{2^4} = \frac{9354210000}{16}$$

$$= 584638125$$

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Q. 80 What will be remainder when $(67^{67} + 67)$ is divided by 68 ?

- [A] 1
- [B] 63
- [C] 66
- [D] 67

Answer Option [C]

Explanation:

$(x^n + 1)$ will be divisible by $(x + 1)$ only when n is odd.

$\therefore (67^{67} + 1)$ will be divisible by $(67 + 1)$

$\therefore (67^{67} + 1) + 66$, when divided by 68 will give 66 as remainder.

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Q. 81 **The difference of the squares of two consecutive even integers is divisible by which of the following integers ?**

- [A] 3
- [B] 4
- [C] 6
- [D] 7

Answer Option [B]

Explanation:

Let the two consecutive even integers be $2n$ and $(2n + 2)$. Then,

$$\begin{aligned}(2n + 2)^2 &= (2n + 2 + 2n)(2n + 2 - 2n) \\ &= 2(4n + 2) \\ &= 4(2n + 1), \text{ which is divisible by 4.}\end{aligned}$$

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Q. 82 **If the number $91876 * 2$ is completely divisible by 8, then the smallest whole number in place of * will be:**

- [A] 1
- [B] 2
- [C] 3
- [D] 4
- [E] None of these

Answer Option [C]

Explanation:

Then number $6x2$ must be divisible by 8.

$\therefore x = 3$, as 632 is divisible 8.

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Q. 83 **$217 \times 217 + 183 \times 183 = ?$**

- [A] 79698
- [B] 80578
- [C] 80698
- [D] 81268

Answer Option [B]

Explanation:

$$\begin{aligned}(217)^2 + (183)^2 &= (200 + 17)^2 + (200 - 17)^2 \\ &= 2 \times [(200)^2 + (17)^2] \quad [\text{Ref: } (a + b)^2 + (a - b)^2 = 2(a^2 + b^2)] \\ &= 2[40000 + 289] \\ &= 2 \times 40289 \\ &= 80578.\end{aligned}$$

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Q. 84 **What is the unit digit in $\{(6374)^{1793} \times (625)^{317} \times (341^{491})\}$?**

- [A] 0
- [B] 2

[C] 3

[D] 5

Answer Option [A]

Explanation:

Unit digit in $(6374)^{1793}$ = Unit digit in $(4)^{1793}$
= Unit digit in $[(4^2)^{896} \times 4]$
= Unit digit in $(6 \times 4) = 4$
Unit digit in $(625)^{317}$ = Unit digit in $(5)^{317} = 5$
Unit digit in $(341)^{491}$ = Unit digit in $(1)^{491} = 1$
Required digit = Unit digit in $(4 \times 5 \times 1) = 0$.

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Q. 85 If the number 653_{xy} is divisible by 90, then $(x + y) = ?$

[A] 2

[B] 3

[C] 4

[D] 6

Answer Option [C]

Explanation:

$90 = 10 \times 9$
Clearly, 653_{xy} is divisible by 10, so $y = 0$
Now, 653_{x0} is divisible by 9.
So, $(6 + 5 + 3 + x + 0) = (14 + x)$ is divisible by 9. So, $x = 4$.
Hence, $(x + y) = (4 + 0) = 4$.

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Q. 86 Which one of the following is the common factor of $(47^{43} + 43^{43})$ and $(47^{47} + 43^{47})$?

[A] $(47 - 43)$

[B] $(47 + 43)$

[C] $(47^{43} + 43^{43})$

[D] None of these

Answer Option [B]

Explanation:

When n is odd, $(x^n + a^n)$ is always divisible by $(x + a)$.
 \therefore Each one of $(47^{43} + 43^{43})$ and $(47^{47} + 43^{47})$ is divisible by $(47 + 43)$.

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Q. 87 If the number $517*324$ is completely divisible by 3, then the smallest whole number in the place of * will be:

[A] 0

[B] 1

[C] 2

[D] None of these

Answer Option [C]

Explanation:

Sum of digits = $(5 + 1 + 7 + x + 3 + 2 + 4) = (22 + x)$, which must be divisible by 3.
 $\therefore x = 2$.

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Q. 88 The smallest 6 digit number exactly divisible by 111 is:

[A] 111111

[B] 110011

- [C] 100011
- [D] 110101
- [E] None of these

Answer Option [C]

Explanation:

The smallest 6-digit number 100000. 111) 100000 (900 999 ----- 100 --- Required number = 100000 + (1

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Q. 89 If x and y are positive integers such that $(3x + 7y)$ is a multiple of 11, then which of the following will be divisible by 11 ?

- [A] $4x + 6y$
- [B] $x + y + 4$
- [C] $9x + 4y$
- [D] $4x - 9y$

Answer Option [D]

Explanation:

By hit and trial, we put $x = 5$ and $y = 1$ so that $(3x + 7y) = (3 \times 5 + 7 \times 1) = 22$, which is divisible by 11.
 $\therefore (4x + 6y) = (4 \times 5 + 6 \times 1) = 26$, which is not divisible by 11;
 $(x + y + 4) = (5 + 1 + 4) = 10$, which is not divisible by 11;
 $(9x + 4y) = (9 \times 5 + 4 \times 1) = 49$, which is not divisible by 11;
 $(4x - 9y) = (4 \times 5 - 9 \times 1) = 11$, which is divisible by 11.

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Q. 90 On dividing a number by 56, we get 29 as remainder. On dividing the same number by 8, what will be the remainder ?

- [A] 4
- [B] 5
- [C] 6
- [D] 7

Answer Option [B]

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Q. 91 What least number must be subtracted from 13601, so that the remainder is divisible by 87 ?

- [A] 23
- [B] 31
- [C] 29
- [D] 37
- [E] 49

Answer Option [C]

Explanation:

87) 13601 (156 87 ----- 490 435 ----- 551 522 --- 29 --- The

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Q. 92 The largest 5 digit number exactly divisible by 91 is:

- [A] 99921
- [B] 99918
- [C] 99981
- [D] 99971

[E] None of these

Answer Option [B]

Explanation:

Largest 5-digit number = 99999 91) 99999 (1098 91 --- 899 819 ---- 809 728 --- 8

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Q. 93 **How many of the following numbers are divisible by 132 ?**
264, 396, 462, 792, 968, 2178, 5184, 6336

- [A] 4
- [B] 5
- [C] 6
- [D] 7

Answer Option [A]

Explanation:

$$132 = 4 \times 3 \times 11$$

So, if the number divisible by all the three number 4, 3 and 11, then the number is divisible by 132 also.

$$264 \rightarrow 11, 3, 4 (/)$$

$$396 \rightarrow 11, 3, 4 (/)$$

$$462 \rightarrow 11, 3 (X)$$

$$792 \rightarrow 11, 3, 4 (/)$$

$$968 \rightarrow 11, 4 (X)$$

$$2178 \rightarrow 11, 3 (X)$$

$$5184 \rightarrow 3, 4 (X)$$

$$6336 \rightarrow 11, 3, 4 (/)$$

Therefore the following numbers are divisible by 132 : 264, 396, 792 and 6336.

Required number of number = 4.

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Q. 94 **$106 \times 106 - 94 \times 94 = ?$**

- [A] 2400
- [B] 2000
- [C] 1904
- [D] 1906
- [E] None of these

Answer Option [A]

Explanation:

$$106 \times 106 - 94 \times 94 = (106)^2 - (94)^2$$

$$= (106 + 94)(106 - 94) \quad [\text{Ref: } (a^2 - b^2) = (a + b)(a - b)]$$

$$= (200 \times 12)$$

$$= 2400.$$

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Q. 95 **A boy multiplied 987 by a certain number and obtained 559981 as his answer. If in the answer both 9 are wrong and the other digits are correct, then the correct answer would be:**

- [A] 553681
- [B] 555181
- [C] 555681
- [D] 556581

Answer Option [C]

Explanation:

$$987 = 3 \times 7 \times 47$$

So, the required number must be divisible by each one of 3, 7, 47
553681 → (Sum of digits = 28, not divisible by 3)
555181 → (Sum of digits = 25, not divisible by 3)
555681 is divisible by 3, 7, 47.

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Q. 96 In a division sum, the remainder is 0. As student mistook the divisor by 12 instead of 21 and obtained 35 as quotient. What is the correct quotient ?

- [A] 0
- [B] 12
- [C] 13
- [D] 20

Answer Option [D]

Explanation:

Number = (12 × 35)

Correct Quotient = $420 \div 21 = 20$

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Q. 97 $666 \div 6 \div 3 = ?$

- [A] 37
- [B] 333
- [C] 111
- [D] 84
- [E] None of these

Answer Option [A]

Explanation:

Given Exp. = $666 \times \frac{1}{6} \times \frac{1}{3} = 37$

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Q. 98 $\{(476 + 424)^2 - 4 \times 476 \times 424\} = ?$

- [A] 2906
- [B] 3116
- [C] 2704
- [D] 2904
- [E] None of these

Answer Option [C]

Explanation:

Given Exp. = $[(a + b)^2 - 4ab]$, where $a = 476$ and $b = 424$

$$= [(476 + 424)^2 - 4 \times 476 \times 424]$$

$$= [(900)^2 - 807296]$$

$$= 810000 - 807296$$

$$= 2704.$$

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Q. 99 The sum of even numbers between 1 and 31 is:

- [A] 6

- [B] 28
- [C] 240
- [D] 512

Answer Option [C]

Explanation:

Let $S_n = (2 + 4 + 6 + \dots + 30)$. This is an A.P. in which $a = 2$, $d = 2$ and $l = 30$

Let the number of terms be n . Then,

$$a + (n - 1)d = 30$$

$$\Rightarrow 2 + (n - 1) \times 2 = 30$$

$$\Rightarrow n = 15.$$

$$\therefore S_n = \frac{n}{2} (a + l) = \frac{15}{2} \times (2 + 30) = (15 \times 16) = 240.$$

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Q. 100 Which natural number is nearest to 8485, which is completely divisible by 75 ?

- [A] 8475
- [B] 8500
- [C] 8550
- [D] 8525
- [E] None of these

Answer Option [A]

Explanation:

On dividing, we get

75)	8485	(113	75	---	98	75	----	235	225	---	10
-----	------	------	----	-----	----	----	------	-----	-----	-----	----

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Q. 101 $3897 \times 999 = ?$

- [A] 3883203
- [B] 3893103
- [C] 3639403
- [D] 3791203
- [E] None of these

Answer Option [B]

Explanation:

$$\begin{aligned} 3897 \times 999 &= 3897 \times (1000 - 1) \\ &= 3897 \times 1000 - 3897 \times 1 \\ &= 3897000 - 3897 \\ &= 3893103. \end{aligned}$$

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Q. 102 What is the unit digit in 7^{105} ?

- [A] 1
- [B] 5
- [C] 7
- [D] 9

Answer Option [C]



Explanation:

Unit digit in $7^{105} =$ Unit digit in $[(7^4)^{26} \times 7]$

But, unit digit in $(7^4)^{26} = 1$

\therefore Unit digit in $7^{105} = (1 \times 7) = 7$

Q. 103 **The sum of how many terms of the series $6 + 12 + 18 + 24 + \dots$ is 1800 ?**

- [A] 16
- [B] 24
- [C] 20
- [D] 18
- [E] 22

Answer Option [B]

Explanation:

This is an A.P. in which $a = 6, d = 6$ and $S_n = 1800$

$$\text{Then, } \frac{n}{2} [2a + (n - 1)d] = 1800$$

$$\Rightarrow \frac{n}{2} [2 \times 6 + (n - 1) \times 6] = 1800$$

$$\Rightarrow 3n(n + 1) = 1800$$

$$\Rightarrow n(n + 1) = 600$$

$$\Rightarrow n^2 + n - 600 = 0$$

$$\Rightarrow n^2 + 25n - 24n - 600 = 0$$

$$\Rightarrow n(n + 25) - 24(n + 25) = 0$$

$$\Rightarrow (n + 25)(n - 24) = 0$$

$$\Rightarrow n = 24$$

Number of terms = 24.

Q. 104 **$(12)^3 \times 6^4 ? 432 = ?$**

- [A] 5184
- [B] 5060
- [C] 5148
- [D] 5084
- [E] None of these

Answer Option [A]

Explanation:

$$\text{Given Exp.} = \frac{(12)^3 \times 6^4}{432} = \frac{(12)^3 \times 6^4}{12 \times 6^2} = (12)^2 \times 6^2 = (72)^2 = 5184$$

Q. 105 **In dividing a number by 585, a student employed the method of short division. He divided the number successively by 5, 9 and 13 (facto**

- [A] 24
- [B] 144
- [C] 292
- [D] 584

Answer Option [D]

Explanation:

$$5 \mid x$$

$$z = 13 \times 1 + 12 = 25 \text{ ----- } 9 \mid y - 4$$

$$y = 9 \times z + 8 = 9 \times 25 + 8 = 233 \text{ -----}$$

Q. 106 $9 + \frac{3}{4} + 7 + \frac{2}{17} - \left(9 + \frac{1}{15} \right) = ?$

[A] $7 + \frac{719}{1020}$

[B] $9 + \frac{817}{1020}$

[C] $9 + \frac{719}{1020}$

[D] $7 + \frac{817}{1020}$

[E] None of these

Answer Option [D]

Explanation:

$$\begin{aligned} \text{Given sum} &= 9 + \frac{3}{4} + 7 + \frac{2}{17} - \left(9 + \frac{1}{15} \right) \\ &= (9 + 7 - 9) + \left(\frac{3}{4} + \frac{2}{17} - \frac{1}{15} \right) \\ &= 7 + \frac{765 + 120 - 68}{1020} \\ &= 7 + \frac{817}{1020} \end{aligned}$$

Q. 107 **On dividing a number by 357, we get 39 as remainder. On dividing the same number 17, what will be the remainder ?**

[A] 0

[B] 3

[C] 5

[D] 11

Answer Option [C]

Explanation:

Let x be the number and y be the quotient. Then,
 $x = 357 \times y + 39$
 $= (17 \times 21 \times y) + (17 \times 2) + 5$
 $= 17 \times (21y + 2) + 5$
 \therefore Required remainder = 5.

Q. 108 **7589 - ? = 3434**

[A] 4242

[B] 4155

[C] 1123

[D] 11023

[E] None of these

Answer Option [B]

Explanation:

Let $7589 - x = 3434$

Then, $x = 7589 - 3434 = 4155$

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Q. 109 Which of the following numbers will completely divide $(3^{25} + 3^{26} + 3^{27} + 3^{28})$?

[A] 11

[B] 16

[C] 25

[D] 30

Answer Option [D]

Explanation:

$(3^{25} + 3^{26} + 3^{27} + 3^{28}) = 3^{25} \times (1 + 3 + 3^2 + 3^3) = 3^{25} \times 40$

$= 3^{24} \times 3 \times 4 \times 10$

$= (3^{24} \times 4 \times 30)$, which is divisible by 30.

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Q. 110 $3 + 33 + 333 + 3.33 = ?$

[A] 362.3

[B] 372.33

[C] 702.33

[D] 702

[E] None of these

Answer Option [B]

Explanation:

$3 + 33 + 333 + 3.33 = 372.33$

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Q. 111 The difference between the local value and the face value of 7 in the numeral 32675149 is

[A] 75142

[B] 64851

[C] 5149

[D] 69993

[E] None of these

Answer Option [D]

Explanation: (Local value of 7) - (Face value of 7) = $(70000 - 7) = 69993$

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Q. 112 If x and y are the two digits of the number $653xy$ such that this number is divisible by 80, then $x + y = ?$

[A] 2 or 6

[B] 4

[C] 4 or 8

[D] 8

[E] None of these

Answer Option [A]

Explanation:

$$80 = 2 \times 5 \times 8$$

Since 653_{xy} is divisible by 2 and 5 both, so $y = 0$.

Now, 653_x is divisible by 8, so 13_x should be divisible by 8.

This happens when $x = 6$.

$$\therefore x + y = (6 + 0) = 6.$$

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Q. 113 **The difference of the squares of two consecutive odd integers is divisible by which of the following integers ?**

- [A] 3
- [B] 6
- [C] 7
- [D] 8

Answer Option [D]

Explanation:

Let the two consecutive odd integers be $(2n + 1)$ and $(2n + 3)$. Then,

$$\begin{aligned} (2n + 3)^2 - (2n + 1)^2 &= (2n + 3 + 2n + 1)(2n + 3 - 2n - 1) \\ &= (4n + 4) \times 2 \\ &= 8(n + 1), \text{ which is divisible by 8.} \end{aligned}$$

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Q. 114 **(4300731) - ? = 2535618**

- [A] 1865113
- [B] 1775123
- [C] 1765113
- [D] 1675123
- [E] None of these

Answer Option [C]

Explanation:

Let $4300731 - x = 2535618$

$$\text{Then } x = 4300731 - 2535618 = 1765113$$

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Q. 115 **4500 x ? = 3375**

- [A] $\frac{2}{5}$
- [B] $\frac{3}{4}$
- [C] $\frac{1}{4}$
- [D] $\frac{3}{5}$
- [E] None of these

Answer Option [B]

Explanation:

$$4500 \times x = 3375 \Rightarrow x = \frac{3375}{4500} = \frac{3}{4}$$

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Q. 116 **(51 + 52 + 53 + ... + 100) = ?**

- [A] 2525
- [B] 2975
- [C] 3225
- [D] 3775

Answer Option [D]

Explanation:

This is an A.P. in which $a = 51$, $l = 100$ and $n = 50$.

$$\therefore \text{Sum} = \frac{n}{2} (a + l) = \frac{50}{2} \times (51 + 100) = (25 \times 151) = 3775.$$

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Q. 117 **A number when divided by 296 leaves 75 as remainder. When the same number is divided by 37, the remainder will be:**

- [A] 1
- [B] 2
- [C] 8
- [D] 11

Answer Option [A]

Explanation:

$$\begin{aligned} \text{Let } x &= 296q + 75 \\ &= (37 \times 8q + 37 \times 2) + 1 \\ &= 37(8q + 2) + 1 \end{aligned}$$

Thus, when the number is divided by 37, the remainder is 1.

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Q. 118 **If the number 97215 * 6 is completely divisible by 11, then the smallest whole number in place of * will be:**

- [A] 3
- [B] 2
- [C] 1
- [D] 5
- [E] None of these

Answer Option [A]

Explanation:

$$\begin{aligned} \text{Given number} &= 97215x6 \\ (6 + 5 + 2 + 9) - (x + 1 + 7) &= (14 - x), \text{ which must be divisible by 11.} \\ \therefore x &= 3 \end{aligned}$$

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Q. 119 **If $1400 \times x = 1050$. Then, $x = ?$**

- [A] $\frac{1}{4}$
- [B] $\frac{3}{5}$
- [C] $\frac{2}{3}$
- [D] $\frac{3}{4}$

[E] None of these

Answer Option [D]

Explanation:

$$1400 \times x = 1050 \Rightarrow x = \frac{1050}{1400} = \frac{3}{4}$$

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Q. 120 **On multiplying a number by 7, the product is a number each of whose digits is 3. The smallest such number is:**

- [A] 47619
- [B] 47719
- [C] 48619
- [D] 47649

Answer Option [A]

Explanation:

By hit and trial, we find that
 $47619 \times 7 = 333333$.

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Q. 121 **On dividing a number by 68, we get 269 as quotient and 0 as remainder. On dividing the same number by 67, what will the remainder ?**

- [A] 0
- [B] 1
- [C] 2
- [D] 3

Answer Option [B]

Explanation:

$$\text{Number} = 269 \times 68 + 0 = 18292 \quad 67 \mid 18292 \quad (273 \quad 134 \quad \text{----} \quad 489 \quad 469 \quad \text{----} \quad 202 \quad 201 \quad \text{---})$$

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Q. 122 **The difference between the place value and the face value of 6 in the numeral 856973 is**

- [A] 973
- [B] 6973
- [C] 5994
- [D] None of these

Answer Option [C]

Explanation: (Place value of 6) - (Face value of 6) = (6000 - 6) = 5994

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Q. 123 **(?) + 3699 + 1985 - 2047 = 31111**

- [A] 34748
- [B] 27474
- [C] 30154
- [D] 27574
- [E] None of these

Answer Option [B]

Explanation:

$$\begin{aligned}x + 3699 + 1985 - 2047 &= 31111 \\ \Rightarrow x + 3699 + 1985 &= 31111 + 2047 \\ \Rightarrow x + 5684 &= 33158 \\ \Rightarrow x &= 33158 - 5684 = 27474.\end{aligned}$$

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Q. 124 Which one of the following can't be the square of natural number ?

- [A] 32761
- [B] 81225
- [C] 42437
- [D] 20164
- [E] None of these

Answer Option [C]

Explanation:

The square of a natural number never ends in 7.
 \therefore 42437 is not the square of a natural number.

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Q. 125 **1904 x 1904 = ?**

- [A] 3654316
- [B] 3632646
- [C] 3625216
- [D] 3623436
- [E] None of these

Answer Option [C]

Explanation:

$$\begin{aligned}1904 \times 1904 &= (1904)^2 \\ &= (1900 + 4)^2 \\ &= (1900)^2 + (4)^2 + (2 \times 1900 \times 4) \\ &= 3610000 + 16 + 15200. \\ &= 3625216.\end{aligned}$$

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Q. 126 Which one of the following numbers is completely divisible by 45?

- [A] 181560
- [B] 331145
- [C] 202860
- [D] 2033555
- [E] None of these

Answer Option [C]

Explanation:

$45 = 5 \times 9$, where 5 and 9 are co-primes.
Unit digit must be 0 or 5 and sum of digits must be divisible by 9.
Among given numbers, such number is 202860.

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Q. 127 **3251 + 587 + 369 - ? = 3007**

- [A] 1250

- [B] 1300
- [C] 1375
- [D] 1200
- [E] None of these

Answer Option [D]

Explanation:

$$3251 \quad \text{Let } 4207 - x = 3007 + 587 \quad \text{Then, } x = 4207 - 3007 = 1200 + 369 \text{ ---- } 4207 \text{ ----}$$

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Q. 128 **(112 x 5⁴) = ?**

- [A] 67000
- [B] 70000
- [C] 76500
- [D] 77200

Answer Option [B]

Explanation:

$$(112 \times 5^4) = 112 \times \left(\frac{10}{2}\right)^4 = \frac{112 \times 10^4}{2^4} = \frac{1120000}{16} = 70000$$

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Q. 129 **What is the unit digit in(7⁹⁵ - 3⁵⁸)?**

- [A] 0
- [B] 4
- [C] 6
- [D] 7

Answer Option [B]

Explanation:

$$\begin{aligned} \text{Unit digit in } 7^{95} &= \text{Unit digit in } [(7^4)^{23} \times 7^3] \\ &= \text{Unit digit in } [(7^4)^{23} \times (343)] \\ &= \text{Unit digit in } (1^{23} \times 343) \\ &= \text{Unit digit in } (343) \\ &= 3 \end{aligned}$$

$$\begin{aligned} \text{Unit digit in } 3^{58} &= \text{Unit digit in } [(3^4)^{14} \times 3^2] \\ &= \text{Unit digit in } [(\text{Unit digit in } (81)^{14} \times 3^2)] \\ &= \text{Unit digit in } [(1)^{14} \times 3^2] \\ &= \text{Unit digit in } (1 \times 9) \\ &= \text{Unit digit in } (9) \\ &= 9 \end{aligned}$$

Unit digit in (7⁹⁵ - 3⁵⁸) = Unit digit in (343 - 9) = Unit digit in (334) = 4.
So, Option B is the answer.

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Q. 130 **How many prime numbers are less than 50 ?**

- [A] 16
- [B] 15
- [C] 14
- [D] 18

Answer Option [B]

Explanation:



Prime numbers less than 50 are:
2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47
Their number is 15

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Q. 131 $(1000)^9 \div 10^{24} = ?$

- [A] 10000
- [B] 1000
- [C] 100
- [D] 10
- [E] None of these

Answer Option [B]

Explanation:

$$\text{Given Exp.} = \frac{(1000)^9}{10^{24}} = \frac{(10^3)^9}{10^{24}} = \frac{(10)^{27}}{10^{24}} = 10^{(27-24)} = 10^3 = 1000$$

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Q. 132 **The smallest prime number is:**

- [A] 1
- [B] 2
- [C] 3
- [D] 4

Answer Option [B]

Explanation: The smallest prime number is 2.

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Q. 133 $1397 \times 1397 = ?$

- [A] 1951609
- [B] 1981709
- [C] 18362619
- [D] 2031719
- [E] None of these

Answer Option [A]

Explanation:

$$\begin{aligned} 1397 \times 1397 &= (1397)^2 \\ &= (1400 - 3)^2 \\ &= (1400)^2 + (3)^2 - (2 \times 1400 \times 3) \\ &= 1960000 + 9 - 8400 \\ &= 1960009 - 8400 \\ &= 1951609. \end{aligned}$$

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Q. 134 $107 \times 107 + 93 \times 93 = ?$

- [A] 19578
- [B] 19418

- [C] 20098
- [D] 21908
- [E] None of these

Answer Option [C]

Explanation:

$$\begin{aligned} 107 \times 107 + 93 \times 93 &= (107)^2 + (93)^2 \\ &= (100 + 7)^2 + (100 - 7)^2 \\ &= 2 \times [(100)^2 + 7^2] \quad [\text{Ref: } (a + b)^2 + (a - b)^2 = 2(a^2 + b^2)] \\ &= 20098 \end{aligned}$$

Q. 135 (800 ? 64) x (1296 ? 36) = ?

- [A] 420
- [B] 460
- [C] 500
- [D] 540
- [E] None of these

Answer Option [E]

Explanation:

$$\text{Given Exp.} = \frac{800}{64} \times \frac{1296}{36} = 450$$

Q. 136 The largest 4 digit number exactly divisible by 88 is:

- [A] 9944
- [B] 9768
- [C] 9988
- [D] 8888
- [E] None of these

Answer Option [A]

Explanation:

Largest 4-digit number = 9999 88) 9999 (113 88 ---- 1199 88 ---- 319 264 --- 55

Q. 137 The sum of first five prime numbers is:

- [A] 11
- [B] 18
- [C] 26
- [D] 28

Answer Option [D]

Explanation:

Required sum = (2 + 3 + 5 + 7 + 11) = 28.
Note: 1 is not a prime number.

Q. 138 If the number 42573 * is exactly divisible by 72, then the minimum value of * is:

- [A] 4
- [B] 5
- [C] 6
- [D] 7
- [E] 8

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Answer Option [C]

Explanation:

$72 = 9 \times 8$, where 9 and 8 are co-prime.

The minimum value of x for which $73x$ for which $73x$ is divisible by 8 is, $x = 6$.

Sum of digits in 425736 = $(4 + 2 + 5 + 7 + 3 + 6) = 27$, which is divisible by 9.

∴ Required value of * is 6.