1. Which one of the following is not a prime number?
A. 31
B. 61
C. 71
D. 91
2. $\left(112 \times 5^{4}\right)=$ ?
A. 67000
B. 70000
C. 76500
D. 77200

Answer: Option B

## Explanation:

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

3. It is being given that $\left(2^{32}+1\right)$ is completely divisible by a whole number. Which of the following numbers is completely divisible by this number?
A. $\left(2^{16}+1\right)$
B. $\left(2^{16}-1\right)$
C. $\left(7 \times 2^{23}\right)$
D. $\left(2^{96}+1\right)$

## Answer: Option D

## Explanation:

Let $2^{32}=x$. Then, $\left(2^{32}+1\right)=(x+1)$.
Let $(x+1)$ be completely divisible by the natural number N . Then,
$\left(2^{96}+1\right)=\left[\left(2^{32}\right)^{3}+1\right]=\left(x^{3}+1\right)=(x+1)\left(x^{2}-x+1\right)$,
which is completely divisible by N , since $(x+1)$ is divisible by N .
4. 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 $=(23-21)$
$=2$.

```
5. 1397 x 1397 = ?
    A. }195160
B. 1981709
C. 18362619
D. 2031719
E. None of these
Answer: Option A
```


## Explanation:

```
\(1397 \times 1397=(1397)^{2}\)
\[
=(1400-3)^{2}
\]
\[
=(1400)^{2}+(3)^{2}-(2 \times 1400 \times 3)
\]
\[
=1960000+9-8400
\]
\[
=1960009-8400
\]
\[
\text { = } 1951609 .
\]
```

Answer: Option D

## Explanation:

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

## 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.
$264 \rightarrow 11,3,4$ (/)
$396 \rightarrow 11,3,4(/)$
$462 \rightarrow 11,3(\mathrm{X})$
$792 \rightarrow 11,3,4(/)$
$968 \rightarrow 11,4(\mathrm{X})$
$2178 \rightarrow 11,3(\mathrm{X})$
$5184 \rightarrow 3,4$ (X)
$6336 \rightarrow 11,3,4$ (/)
Therefore the following numbers are divisible by 132 : 264, 396, 792 and 6336.
Required number of number $=4$.

```
7. \((935421 \times 625)=\) ?
\begin{tabular}{ll} 
A. 575648125 & B. 584638125 \\
C. 584649125 & D. 585628125
\end{tabular}
Answer: Option B
Explanation:
\(935421 \times 625=935421 \times 5^{4}=935421 \times\binom{ 10}{2}^{4}\)
\(={ }_{2}^{935421 \times 10^{4}}=\frac{9354210000}{16}\)
\(=584638125\)
```

8. 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

Required number $=(9999-55)$
$=9944$.
9. Which of the following is a prime number ?
A. 33
B. 81
C. 93
D. 97

## Answer: Option D <br> Explanation:

Clearly, 97 is a prime number.
10. What is the unit digit in $\left\{(6374)^{1793} \mathrm{x}(625)^{317} \mathrm{x}\right.$ $\left.\left(341^{491}\right)\right\}$ ?
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 $\left[\left(4^{2}\right)^{896} \mathrm{x} 4\right]$
$=$ 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 $(4 \times 5 \times 1)=0$.
11. $5358 \times 51=$ ?
A. 273258
B. 273268
C. 273348
D. 273358

## Answer: Option A

## Explanation:

$5358 \times 51=5358 \times(50+1)$

$$
\begin{aligned}
& =5358 \times 50+5358 \times 1 \\
& =267900+5358 \\
& =273258 .
\end{aligned}
$$

12. 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.
Definition: A prime number (or a prime) is a natural number that has exactly two distinct natural number divisors: 1 and itself.
13. 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).
$\therefore x+1365=6 x+15$
$\Rightarrow 5 x=1350$
$\Rightarrow x=270$
$\therefore$ Smaller number $=270$.
14. $(12)^{3} \times 6^{4} \div 432=$ ?
A. 5184
B. 5060
C. 5148
D. 5084
E. None of these

Answer: Option A
Explanation:
$\begin{array}{ll}\text { Given Exp. } \\ = & (12)^{3} \mathrm{x} \\ 6^{4} & (12)^{3} \mathrm{x} \\ =6^{4} & =(12)^{2} \times 6^{2}=(72)^{2}= \\ 432 & 5184\end{array}$ $=\begin{array}{lll} & 6^{4} & =6^{4} \\ & 432 & 12 \times 6^{2}\end{array}$
15. $72519 \times 9999=$ ?
A. 725117481
B. 674217481
C. 685126481
D. 696217481
E. None of these

Answer: Option A
Explanation:

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

16. 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 .
$\therefore \quad x=2$.
17. 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.
18. 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.
19. (?) $-19657-33994=9999$
$\begin{array}{ll}\text { A. } 63650 & \text { B. } 53760 \\ \text { C. } 59640 & \text { D. } 61560\end{array}$
E. None of these

Answer: Option A
Explanation:
19657 Let $x-53651=9999$
33994 Then, $x=9999+53651=63650$
-----
53651
20. The sum of first 45 natural numbers is:
A. 1035
B. 1280
C. 2070
D. 2140

## Answer: Option A

## Explanation:

Let $S_{n}=(1+2+3+\ldots+45)$. This is an A.P. in which a $=1, \mathrm{~d}=1, \mathrm{n}=45$.

$=45 \times(20+3)$
$=45 \times 20+45 \times 3$
$=900+135$
$=1035$.

## Shorcut Method:

$\mathrm{S}_{\mathrm{n}}={ }_{2}^{n(n+1)}=\frac{45(45+1)}{2}=1035$.
21. 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.
Cibsuder oart (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 ( $3 \times 8$ ), i.e., 24 .
22. $753 \times 753+247 \times 247-753 \times 247=$ ?
$753 \times 753 \times 753+247 \times 247 \times 247=$ ?

| A 1 | B 1 |
| :---: | :---: |
| ${ }^{\text {A }} 1000$ | B. 506 |
| C. 253 | D.None of these |

Answer: Option A

## Explanation:

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

| 23. (?) $+3699+1985-2047=$ | 31111 |
| :--- | :--- |
| A. 34748 $\underline{\text { B. }} 27474$ <br> C. 30154 $\underline{\text { D. } 27574}$ <br> E. None of these  |  |

## Answer: Option B

## Explanation:

$x+3699+1985-2047=31111$
$\Rightarrow x+3699+1985=31111+2047$
$\Rightarrow x+5684=33158$
$\Rightarrow x=33158-5684=27474$.
24. 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

## Explanation:

Sum of digits $=(4+8+1+x+6+7+3)=(29+x)$, which must be divisible by 9 .
$\therefore \quad x=7$.
25. 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 <br> Explanation:

$($ Local value of 7$)-($ Face value of 7$)=(70000-7)=$ 69993
26. The difference between a positive proper fraction and its reciprocal is $9 / 20$. The fraction is:
A. $_{5}^{3}$
B. ${ }_{10}^{3}$
$\mathrm{C}_{\mathbf{C}}{ }_{5}^{4}$
${ }^{\mathrm{D}_{-}^{4}} 3$

## Answer: Option C <br> Explanation:

Let the required fraction be $x$. Then ${ }_{X}^{1}-x=\frac{9}{20}$
$\therefore \quad 1-x^{2}=\frac{9}{20}$
$\Rightarrow 20-20 x^{2}=9 x$
$\Rightarrow 20 x^{2}+9 x-20=0$
$\Rightarrow 20 x^{2}+25 x-16 x-20=0$
$\Rightarrow 5 x(4 x+5)-4(4 x+5)=0$
$\Rightarrow(4 x+5)(5 x-4)=0$
$x=\frac{4}{5}$
27. 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

Explanation:
No answer description available for this question. Let us discuss.
28. If $n$ is a natural number, then $\left(6 n^{2}+6 n\right)$ is always divisible by:
A. 6 only
B. 6 and 12 both
C. 12 only
D.by 18 only

## Answer: Option B

## Explanation:

$\left(6 n^{2}+6 n\right)=6 n(n+1)$, which is always divisible by 6 and 12 both, since $n(n+1)$ is always even.
29. $107 \times 107+93 \times 93=$ ?
A. 19578
B. 19418
C. 20098
D. 21908
E. None of these

Answer: Option C

Answer: Option D

## Explanation:

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

30. What will be remainder when $\left(67^{67}+67\right)$ is divided by 68 ?
A. 1
B. 63
C. 66
D. 67

Answer: Option C

## Explanation:

$\left(x^{\mathrm{n}}+1\right)$ will be divisible by $(x+1)$ only when $n$ is odd.
$\therefore\left(67^{67}+1\right)$ will be divisible by $(67+1)$
$\therefore\left(67^{67}+1\right)+66$, when divided by 68 will give 66 as remainder.
31. 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.
$\therefore \quad x=5 \mathrm{k}+3$
$\Rightarrow x^{2}=(5 \mathrm{k}+3)^{2}$
$=\left(25 k^{2}+30 k+9\right)$
$=5\left(5 k^{2}+6 k+1\right)+4$
$\therefore$ On dividing $x^{2}$ by 5 , we get 4 as remainder.
32. 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 $t_{\mathrm{n}}=996$.
$\therefore a+(n-1) \mathrm{d}=996$
$\Rightarrow 102+(n-1) \times 6=996$
$\Rightarrow 6 \mathrm{x}(\mathrm{n}-1)=894$
$\Rightarrow(n-1)=149$
$\Rightarrow n=150$
$\therefore$ Number of terms $=150$.
33. 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 $\mathrm{t}_{\mathrm{n}}=96 \Rightarrow a+(n-1) d=96$
$\Rightarrow 24+(n-1) \times 6=96$
$\Rightarrow(n-1) \times 6=72$
$\Rightarrow(n-1)=12$
$\Rightarrow n=13$
Required number of numbers $=13$.
34. 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
$2133 \rightarrow 9(\mathrm{X})$
$2343 \rightarrow 12$ (/)
$3474 \rightarrow 18$ ( X )
$4131 \rightarrow 9(\mathrm{X})$
$5286 \rightarrow 21(/)$
$5340 \rightarrow 12(/)$
$6336 \rightarrow 18(\mathrm{X})$
$7347 \rightarrow 21(/)$
$8115 \rightarrow 15(/)$
$9276 \rightarrow 24$ (/)
Required number of numbers $=6$.
35. $(963+476)^{2}+(963-476)^{2}$
$\begin{array}{ll}(963 \times 963+476 \times 476)\end{array}$
$\begin{array}{ll}\text { A. } 1449 & \text { B. } 497 \\ \begin{array}{ll}\text { C. } 2 & \underline{\text { D. }} 4\end{array} \\ \text { E. None of these } & \end{array}$

Answer: Option C
Explanation:
Given Exp. $=\begin{aligned} & (a+b)^{2}+(a-b)^{2} \\ & \left(a^{2}+b^{2}\right)\end{aligned}=\begin{aligned} & 2\left(a^{2}+b^{2}\right)=2 \\ & \left(a^{2}+b^{2}\right)\end{aligned}$
36. 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, $\ldots$, 996
This is an A.P. in which $a=102, d=6$ and $l=996$
Let the number of terms be $n$. Then,
$a+(n-1) d=996$
$\Rightarrow 102+(n-1) \times 6=996$
$\Rightarrow 6 \times(n-1)=894$
$\Rightarrow(n-1)=149$
$\Rightarrow n=150$.
37. A 3-digit number $4 a 3$ 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 |
$984\}==>a+8=b==>b-a=8$
13 b 7
Also, $13 b 7$ is divisible by $11 \Rightarrow(7+3)-(b+1)=$ (9-b)

$$
\begin{aligned}
& \Rightarrow(9-b)=0 \\
& \Rightarrow b=9 \\
& \therefore(b=9 \text { and } a=1) \quad \Rightarrow(a+b)=10 .
\end{aligned}
$$

38. 8597-? = 7429-4358
A. 5426
B. 5706
C. 5526
D. 5476
E. None of these
_Answer: Option C
Explanation:
7429 Let $8597-\mathrm{x}=3071$
-4358 Then, $x=8597-3071$
---- = 5526
3071
39. The smallest prime number is:
A. 1
B. 2
C. 3
D. 4
_Answer: Option B

## Explanation:

The smallest prime number is 2 .

```
40. (12345679 x 72) =?
```

A. 88888888
B. 888888888

```
C. 898989898
D. 9999999998
_Answer: Option B
```


## Explanation:

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

41. 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,
$x=357 \times y+39$
$=(17 \times 21 \times y)+(17 \times 2)+5$
$=17 \times(21 y+2)+5)$
$\therefore$ Required remainder $=5$.
42. If the product $4864 \times 9$ P 2 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, $(9+\mathrm{P}+2)$ must be divisible by 3 .
$\therefore \mathrm{P}=1$.
43. Which one of the following is the common factor of
$\left(47^{43}+43^{43}\right)$ and $\left(47^{47}+43^{47}\right)$ ?
A. $(47-43)$
B. $(47+43)$
C. $\left(47^{43}+43^{43}\right)$
D.None of these

## Answer: Option B

## Explanation:

When $n$ is odd, $\left(x^{n}+a^{n}\right)$ is always divisible by $(x+a)$.
$\therefore$ Each one of $\left(47^{43}+43^{43}\right)$ and $\left(47^{47}+43^{43}\right)$ is
divisible by $(47+43)$.
44. $-84 \times 29+365=$ ?
A. 2436
B. 2801
C. -2801
D.-2071
E. None of these

Answer: Option D
Explanation:

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

45. 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:
Let $x=296 q+75$

$$
\begin{aligned}
& =(37 \times 8 q+37 \times 2)+1 \\
& =37(8 q+2)+1
\end{aligned}
$$

Thus, when the number is divided by 37 , the remainder is 1 .
46. In dividing a number by 585 , a student employed the method of short division. He divided the number successively by 5,9 and 13 (factors 585) and got the remainders $4,8,12$ respectively. If he had divided the number by 585 , the remainder would have been
A. 24
B. 144
C. 292
D. 584

## Answer: Option D

Explanation:
$5 \mid x \quad z=13 \times 1+12=25$
-------------
$9 \mid y-4 \quad y=9 \times z+8=9 \times 25+8=233$
$13 \mid z-8 \quad x=5 \mathrm{x} y+4=5 \mathrm{x} 233+4=1169$
--------------
| 1-12
585) $1169(1$

585
---
584
Therefore, on dividing the number by 585, remainder $=584$.
47. 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:

Divisor $=(5 \times 46)=230$
$\therefore 10 \times$ Quotient $=230 \Rightarrow={ }_{10}^{230}=23$
Dividend $=($ Divisor $\times$ Quotient $)+$ Remainder

$$
\begin{aligned}
& =(230 \times 23)+46 \\
& =5290+46 \\
& =5336 .
\end{aligned}
$$

48. 4500 x ? $=3375$

| A. $_{5}^{2}$ | $\underline{B}_{4}^{3}$ |
| :--- | :--- |
| $\underline{C}_{4}^{1}$ | $\underline{\mathrm{D}}_{5}^{3}$ |

E. None of these
_Answer: Option B
Explanation:
$4500 \mathrm{x} x=3375 \Rightarrow x=\frac{3375^{75}}{4500_{100}}=\frac{3}{4}$
49. 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

50. 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
51. $4766^{* *} 0$ 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 .
$x-y-3=0 \Rightarrow y=x-3$
$(17+x+y)=(17+x+x-3)=(2 x+14)$
$\Rightarrow x=2$ or $x=8$.
$\therefore x=8$ and $y=5$.
52. 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:
Given number $=97215 \times 6$
$(6+5+2+9)-(x+1+7)=(14-x)$, which must be divisible by 11 .
$\therefore x=3$
53. $\left(11^{2}+12^{2}+13^{2}+\ldots+20^{2}\right)=$ ?
A. 385
B. 2485
C. 2870
D. 3255

Answer: Option B
Explanation:
$\left(11^{2}+12^{2}+13^{2}+\ldots+20^{2}\right)=\left(1^{2}+2^{2}+3^{2}+\ldots+\right.$
$\left.20^{2}\right)-\left(1^{2}+2^{2}+3^{2}+\ldots+10^{2}\right)$
$\left[\begin{array}{ll}\text { Ref: }\left(1^{2}+2^{2}+3^{2}+\ldots+n^{2}\right) & 1_{n(n+1)(2 n+} \\ = & 61)\end{array}\right]$
$=\left(\begin{array}{ll}20 \times 21 \times 41 \\ 6 & -6\end{array}\right)$
$=(2870-385)$
$=2485$.
54. 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, $x=2$.
55. Which of the following numbers will completely divide $\left(49^{15}-1\right)$ ?
$\begin{array}{ll}\text { A. } 8 & \text { B. } 14 \\ \text { C. } 46 & \underline{\text { D. } 50}\end{array}$

## Answer: Option A

## Explanation:

( $x^{n}-1$ ) will be divisibly by $(x+1)$ only when $n$ is even.
$\left(49^{15}-1\right)=\left\{\left(7^{2}\right)^{15}-1\right\}=\left(7^{30}-1\right)$, which is divisible by $(7+1)$, i.e., 8 .
56. $9+\stackrel{3}{4}+7+\stackrel{2}{17}-\left(9+\begin{array}{c}1 \\ 15\end{array}\right)=$ ?
A. $7+\begin{aligned} & 719 \\ & 1020\end{aligned}$
B. $9+{ }_{1020}^{817}$
C. $9+\begin{aligned} & 719 \\ & 1020\end{aligned}$
D. $7+\begin{aligned} & 817 \\ & 1020\end{aligned}$
E. None of these

## Answer: Option D

## Explanation:

Given sum $=9+\frac{3}{4}+7+\frac{2}{17}\left(9+\begin{array}{c}1 \\ 15\end{array}\right)$

$$
\begin{aligned}
& =(9+7-9)+\left(\begin{array}{cc}
3 & 2 \\
4^{+} & 1 \\
-1 & 15
\end{array}\right) \\
& =7+\begin{array}{l}
765+120-68 \\
1020
\end{array} \\
& =7+\frac{817}{1020}
\end{aligned}
$$

57. $\binom{1}{1-n}+\binom{2}{n}+\left(1-\frac{3}{n}\right)+\ldots$ up to $n$ terms $=$ ?
A. ${ }_{2}^{1} n$
B. ${ }_{2}^{1}(n-1)$
C. $2_{2}^{1} n(n-1)$
D.None of these

## Answer: Option B

## Explanation:

$\begin{array}{l}\text { Given } \\ \text { sum }\end{array} \quad n$ terms $)$$\left(\begin{array}{l}1+1+\ldots \text { to } \\ -\left(\begin{array}{ll}1 & 2\end{array} 3_{+} \ldots \text { to } n\right. \\ n \\ n\end{array}\right)$

$$
\begin{aligned}
& \left.=n \quad n\left(\begin{array}{c}
1+ \\
- \\
1
\end{array}\right) 1\right] \quad[\text { Ref: } n \text {th terms }=(n / n)= \\
& =n-\frac{n+1}{2} \\
& =\frac{1}{2}(n-1)
\end{aligned}
$$

58. 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

## 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 .
59. A boy multiplied 987 by a certain number and obtained 559981 as his answer. If in the answer both 98 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
$553681 \rightarrow$ (Sum of digits $=28$, not divisible by 3 )
$555181 \rightarrow$ (Sum of digits $=25$, not divisible by 3 )
555681 is divisible by 3, 7,47 .
60. 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

Therefore, the required number $=29$.
61. 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:
$x=13 p+11$ and $x=17 q+9$
$\therefore 13 p+11=17 q+9$
$\Rightarrow 17 q-13 p=2$
$\Rightarrow q=\frac{2+13 p}{17}$
The least value of $p$ for
$2+$
$13 p$ is a whole number is $p$ 17
$=26$
which $q=$
$\therefore \quad x=(13 \times 26+11)$
$=(338+11)$
$=349$
62. $(51+52+53+\ldots+100)=$ ?

| A. 2525 | B. 2975 |
| :--- | :--- |
| C. 3225 | $\underline{\text { D. } 3775}$ |

Answer: Option D

## Explanation:

$$
\begin{aligned}
& \mathrm{S}_{\mathrm{n}}=(1+2+3+\ldots+50+51+52+\ldots+100)-(1+2+ \\
& 3+\ldots+50) \\
& \quad=100 \times(1+100)-50 \times(1+50) \\
& \quad=(50 \times 101)-(25 \times 51) \\
& \quad=(5050-1275) \\
& \quad=3775 .
\end{aligned}
$$

63. $(800 \div 64) \times(1296 \div 36)=$ ?
A. 420 B. 460
C. 500 D. 540
E. None of these

## Answer: Option E

## Explanation:

Given Exp. $=800 \mathrm{x}_{36}^{1296}=450$
64. 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
98
75
235
225
---
10

Required number $=(8485-10)$

$$
=8475 .
$$

65. 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

Answer: Option C

## Explanation:

$72=9 \mathrm{x} 8$, where 9 and 8 are co-prime.
The minimum value of x for which $73 x$ for which $73 x$ is divisible by 8 is, $x=6$.
Sum of digits in $425736=(4+2+5+7+3+6)=27$, which is divisible by 9 .
$\therefore$ Required value of $*$ is 6 .
66. 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 $3,7,9,11$.
67. 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) 9217 (104

Therefore, Required number $=9217+(88-65)$

$$
\begin{aligned}
& =9217+23 \\
& =9240 .
\end{aligned}
$$

68. $(4300731)-?=2535618$
A. 1865113
B. 1775123
C. 1765113
D. 1675123
E. None of these
Answer: Option C
Explanation:
Let $4300731-x=2535618$
Then $x$, $=4300731-2535618=1765113$
69. $n$ is a whole number which when divided by 4 gives 3 as remainder. What will be the remainder when $2 n$ is divided by 4 ?
A. 3
B. 2
C. 1
D. 0

## Answer: Option B

## Explanation:

Let $n=4 q+3$. Then $2 n=8 q+6=4(2 q+1)+2$.
Thus, when $2 n$ is divided by 4 , the remainder is 2 .
70. $(489+375)^{2}-(489-375)^{2}=$ ?
( $489 \times 375$ )
$\begin{array}{ll}\text { A. } 144 & \text { B. } 864 \\ \begin{array}{ll}\text { C. } 2 & \text { D. } 4\end{array} \\ \text { E. None of these } & \end{array}$

## Answer: Option D

Explanation:
Given Exp. $={ }_{a b}^{(a+b)^{2}-(a-b)^{2}}=\begin{aligned} & 4 a b=4 \\ & a b\end{aligned}$
71. $397 \times 397+104 \times 104+2 \times 397 \times 104=$ ?
A. 250001
B. 251001
D. 261001
C. 260101

Answer: Option B
Explanation:
Given Exp. $=(397)^{2}+(104)^{2}+2 \times 397 \times 104$

$$
\begin{aligned}
& =(397+104)^{2} \\
& =(501)^{2}=(500+1)^{2}
\end{aligned}
$$

$$
\begin{aligned}
& =\left(500^{2}\right)+(1)^{2}+(2 \times 500 \times 1) \\
& =250000+1+1000 \\
& =251001
\end{aligned}
$$

72. $(35423+7164+41720)-(317 \times 89)=$ ?

| A. 28213 | B. 84307 |
| :--- | :--- |
| C. 50694 | $\underline{\text {. }} 56094$ |
| E. None of these |  |

Answer: Option D

## Explanation:

$35423 \quad 317$ x $89=317 \times(90-1)$
$+7164=(317 \times 90-317)$
$+41720=(28530-317)$
$=28213$
84307

- 28213

56094
73. $\left(x^{\mathrm{n}}-a^{\mathrm{n}}\right)$ is completely divisible by $(x-a)$, when
A. $n$ is any natural number B. ${ }_{n}^{n}$ is an even natural
$C_{\text {C. }}^{n}$ number $n$ is and natural
D. $n$ is prime

## Answer: Option A

## Explanation:

For every natural number $n,\left(x^{n}-a^{n}\right)$ is completely divisible by $(x-a)$.
74. 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.
75. Which of the following numbers will completely divide $\left(3^{25}+3^{26}+3^{27}+3^{28}\right)$ ?
A. 11
B. 16
C. 25
D. 30

Answer: Option D

## Explanation:

$\left(3^{25}+3^{26}+3^{27}+3^{28}\right)=3^{25} \times\left(1+3+3^{2}+3^{3}\right)=3^{25} \times 40$
$=3^{24} \times 3 \times 4 \times 10$
$=\left(3^{24} \times 4 \times 30\right)$, which is divisible by30.
76. 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 $x=6 q+3$.
Then, $x^{2}=(6 q+3)^{2}$
$=36 q^{2}+36 q+9$
$=6\left(6 q^{2}+6 q+1\right)+3$
Thus, when $x^{2}$ is divided by 6 , then remainder $=3$.
77. The sum of the two numbers is 12 and their product is 35. What is the sum of the reciprocals of these numbers ?
A.
-35
B. ${ }_{35}^{1}$
С. ${ }_{8}^{35}$
D. ${ }^{7}$

## Answer: Option A

## Explanation:

Let the numbers be $a$ and $b$. Then, $a+b=12$ and $a b=$ 35.
$\therefore \begin{aligned} & a+b_{1} 12 \\ & a b\end{aligned}=\left(\begin{array}{ll}1 & 1 \\ b^{+} & a\end{array}\right)=\begin{aligned} & 12 \\ & 35\end{aligned}$
$\therefore$ Sum of reciprocals of given numbers $=\frac{12}{35}$
78. 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. $\left(x^{n}-a^{n}\right)$ is completely divisibly by ( $x+$ a)
$\left(17^{200}-1^{200}\right)$ is completely divisible by $(17+1)$, i.e., 18 .
$\Rightarrow\left(17^{200}-1\right)$ is completely divisible by 18 .
$\Rightarrow$ On dividing $17^{200}$ by 18 , we get 1 as remainder.
79. If $1400 \mathrm{x} x=1050$. Then, $x=$ ?
A. ${ }_{4}^{1}$
B. ${ }_{5}^{3}$
C. 2
$\mathrm{D}_{4}^{3}$
E. None of these

Answer: Option D

## Explanation:

$1400 \times x=1050 \Rightarrow x=1050=3$
80. $\left(1^{2}+2^{2}+3^{2}+\ldots+10^{2}\right)=$ ?
A. 330
B. 345
C. 365
D. 385

## Answer: Option D

## Explanation:

We know that $\left(1^{2}+2^{2}+3^{2}+\ldots+n^{2}\right)={ }_{6}^{1} n(n+1)(2 n+1)$
Putting $n=10$, required sum $=\left(\begin{array}{l}1 \\ 6\end{array} \mathrm{x} 10 \times 11 \times 21\right)=385$
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 $2 n$ and ( $2 n+$ 2). Then,

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

82. 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.
83. 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 $=(2+4+6+\ldots+30)$
This is an A.P. in which $a=2, d=(4-2)=2$ and $l=30$.
Let the number of terms be $n$. Then,
$\mathrm{t}_{\mathrm{n}}=30 \Rightarrow a+(n-1) d=30$
$\Rightarrow 2+(n-1) \times 2=30$
$\Rightarrow n-1=14$
$\Rightarrow n=15$
$\therefore \mathrm{S}_{\mathrm{n}}={ }_{2}^{n}(a+l)={ }_{2}^{15} \mathrm{x}(2+30)=240$.
84. 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$)=(6000-6)=5994$
85. If $a$ and $b$ are odd numbers, then which of the following is even?
A. $a+b$
B. $a+b+1$
C. $a b$
$\underline{\text { D. }} a b+2$
E. None of these

Answer: Option A

## Explanation:

The sum of two odd number is even. So, $a+b$ is even.
86. 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:

$99=11 \times 9$, where 11 and 9 are co-prime.
By hit and trial, we find that 114345 is divisibleby 11 as well as 9 . So, it is divisible by 99 .
87. The sum of how may tersm of the series $6+12+18+$ $24+\ldots$ 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 $\mathrm{S}_{\mathrm{n}}=1800$
Then, ${ }_{2}[2 a+(n-1) d]=1800$
$\Rightarrow{ }_{2}^{n}[2 \times 6+(n-1) \times 6]=1800$
$\Rightarrow 3 n(n+1)=1800$
$\Rightarrow n(n+1)=600$
$\Rightarrow n^{2}+n-600=0$
$\Rightarrow n^{2}+25 n-24 n-600=0$
$\Rightarrow n(n+25)-24(n+25)=0$
$\Rightarrow(n+25)(n-24)=0$
$\Rightarrow n=24$
Number of terms $=24$.
88. $(51+52+53+\ldots+100)=$ ?
A. 2525
B. 2975
C. 3225
D. 3775

Answer: Option D
Explanation:
This is an A.P. in which $a=51, l=100$ and $n=50$.
$\therefore$ Sum $n\left(a+=\begin{array}{l}50 \times(51+100) \\ = \\ 2 l)\end{array}=(25 \times 151)=\right.$
23775.
89. $1904 \times 1904=$ ?
A. 3654316
B. 3632646
C. 3625216
D. 3623436
E. None of these

Answer: Option C
Explanation:
$1904 \times 1904=(1904)^{2}$

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

90. What is the unit digit $\operatorname{in}\left(7^{95}-3^{58}\right)$ ?
A. 0
B. 4
C. 6
D. 7

Answer: Option B

## Explanation:

Unit digit in $7^{95}=$ Unit digit in $\left[\left(7^{4}\right)^{23} \times 7^{3}\right]$
$=$ Unit digit in [(Unit digit in(2401) $)^{23} \mathrm{x}$ (343)]
$=$ Unit digit in ( $1^{23} \times 343$ )
$=$ Unit digit in (343)
$=3$
Unit digit in $3^{58}=$ Unit digit in $\left[\left(3^{4}\right)^{14} \times 3^{2}\right]$
$=$ Unit digit in [Unit digit in $(81)^{14} \times 3^{2}$ ]
$=$ Unit digit in $\left[(1)^{14} \times 3^{2}\right]$
$=$ Unit digit in (1 x 9)
$=$ Unit digit in (9)

$$
=9
$$

Unit digit in $\left(7^{95}-3^{58}\right)=$ Unit digit in $(343-9)=$ Unit digit in $(334)=4$.
So, Option B is the answer.
91. 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.
92. 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 $=100000+(111-100)$

$$
=100011 \text {. }
$$

93. 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
81

Required number $=(99999-81)$

$$
=99918 .
$$

```
94. \(768 \times 768 \times 768+232 \times 232 \times 232=\) ?
    \(768 \times 768-768 \times 232+232 \times 232=\) ?
    A. 1000 B. 536
    C. 500
    D. 268
    E. None of these
    Answer: Option A
    Explanation:
    \(\begin{array}{ll}\text { Given Exp. } \\ = & \begin{array}{l}\left(a^{3}+b^{3}\right) \\ \left(a^{2}-a b+\right. \\ \left.b^{2}\right)\end{array} \\ =(a+b)=(768+232)= \\ 1000\end{array}\)
    \(\left.=\quad b^{2}\right)\)
```

95. 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
---
37

Required number $=10000+(41-37)$

$$
=10004 \text {. }
$$

96. How many terms are there in the G.P. $3,6,12,24, \ldots$, 384 ?
A. 8
B. 9
C. 10
D. 11
E. 7

Answer: Option A
Explanation:
Here $a=3$ and $r={ }_{3}^{6}=2$. Let the number of terms be $n$.
Then, $\mathrm{t}_{\mathrm{n}}=384 \Rightarrow a r^{n-1}=384$
$\Rightarrow 3 \times 2^{n-1}=384$
$\Rightarrow 2^{n-1}=128=2^{7}$
$\Rightarrow n-1=7$
$\Rightarrow n=8$
$\therefore$ Number of terms $=8$.
97. If $x$ and $y$ are positive integers such that $(3 x+7 y)$ is a multiple of 11 , then which of the following will be divisible by 11 ?
A. $4 x+6 y$
B. $x+y+4$
C. $9 x+4 y$
D. $4 x-9 y$

Answer: Option D

## Explanation:

By hit and trial, we put $x=5$ and $y=1$ so that ( $3 x+7 y$ ) $=(3 \times 5+7 \times 1)=22$, which is divisible by 11 .
$\therefore(4 x+6 y)=(4 \times 5+6 \times 1)=26$, which is not divisible by 11;
$(x+y+4)=(5+1+4)=10$, which is not divisible by 11;
$(9 x+4 y)=(9 \times 5+4 \times 1)=49$, which is not divisible by 11;
$(4 x-9 y)=(4 \times 5-9 \times 1)=11$, which is divisible by 11 .
98. $9548+7314=8362+(?)$
A. 8230
B. 8410
C. 8500
D. 8600
E. None of these

Answer: Option C
Explanation:

$$
\begin{array}{cl}
9548 & 16862=8362+x \\
+7314 & x=16862-8362 \\
---- & =8500
\end{array}
$$

16862
99. 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 x 35)
Correct Quotient $=420 \div 21=20$
100. $2+2^{2}+2^{3}+\ldots+2^{9}=$ ?
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 $n=9$.
$\therefore \mathrm{S}_{\mathrm{n}}$
$\left.=\begin{array}{l}a\left(r^{n}-2 \times\left(2^{9}-\right.\right. \\ = \\ (r-1) \\ =(2-1)\end{array}\right) \quad 1022$.
101. The sum of even numbers between 1 and 31 is:
A. 6
B. 28
C. 240
D. 512

## Answer: Option C

## Explanation:

Let $S_{n}=(2+4+6+\ldots+30)$. This is an A.P. in which $a=2, d=2$ and $l=30$
Let the number of terms be $n$. Then,
$a+(n-1) d=30$
$\Rightarrow 2+(n-1) \times 2=30$
$\Rightarrow n=15$.
$\therefore \mathrm{S}_{\mathrm{n}}={ }_{2}^{\mathrm{n}}(a+l)={ }_{2}^{15} \times(2+30)=(15 \times 16)=240$.
102. 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 $6 x 2$ must be divisible by 8 .
$\therefore \quad x=3$, as 632 is divisible 8 .
103. $2056 \times 987=$ ?
A. 1936372
B. 2029272
C. 1896172
D. 1926172
E. None of these

Answer: Option B

## Explanation:

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

$$
\begin{aligned}
& =2056 \times 1000-2056 \times 13 \\
& =2056000-26728 \\
& =2029272 .
\end{aligned}
$$

104. 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
$47619 \times 7=333333$.
105. If $60 \%$ of $5_{5}^{3}$ 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
$60 \%$ of $_{5}^{3}$ of $x=36$
$\Rightarrow{ }_{100}^{60} \mathrm{x}_{5}^{3} \mathrm{x} x=36$
$\Rightarrow x=\left(36 \mathrm{x}_{9}^{25}\right)=100$
$\therefore$ Required number $=100$
106. 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 $653 x y$ is divisible by 2 and 5 both, so $y=0$.
Now, $653 \times 0$ is divisible by 8 , so $3 x 0$ should be divisible by 8 .
This happens when $x=2$ or 6 .
$\therefore x+y=(2+0)=2 \quad[$ or $] \quad x+y=(6+0)=6$.
107. 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 $(2 n+1)$ and $(2 n+3)$. Then,
$(2 n+3)^{2}-(2 n+1)^{2}=(2 n+3+2 n+1)(2 n+3-2 n-$
1)
$=(4 n+4) \times 2$
$=8(n+1)$, which is divisible by 8 .
108. What is the unit digit in $(4137)^{754}$ ?
A. 1
B. 3
C. 7
D. 9

## Answer: Option D

## Explanation:

Unit digit in $(4137)^{754}=$ Unit digit in $\left\{\left[(4137)^{4}\right]^{188} \mathrm{x}\right.$ (4137) ${ }^{2}$ \}
$=$ Unit digit in $\{292915317923361 \times 17114769\}$
$=(1 \times 9)=9$
109. $587 \times 999=$ ?
A. 586413
B. 587523
C. 614823
D. 615173

Answer: Option A
Explanation:
$587 \times 999=587 \times(1000-1)$

$$
\begin{aligned}
& =587 \times 1000-587 \times 1 \\
& =587000-587 \\
& =586413 .
\end{aligned}
$$

110. 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:

## $4 \mid x$

$z=6 \times 1+4=10$
$5 \mid y-2 \quad y=5 \times z+3=5 \times 10+3=53$
$6 \mid z-3 \quad x=4 \times y+2=4 \times 53+2=214$
|1-4
Hence, required number $=214$.
111. 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:

$20 \mathrm{x} x=(64+36)(64-36)=100 \times 28$
$\Rightarrow x=\frac{100 \times 28}{20}=140$
112. 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.
113. $\left(2^{2}+4^{2}+6^{2}+\ldots+20^{2}\right)=$ ?
A. 770
B. 1155
C. 1540
D. $385 \times 385$

## Answer: Option C

## Explanation:

$\left(2^{2}+4^{2}+6^{2}+\ldots+20^{2}\right)=(1 \times 2)^{2}+(2 \times 2)^{2}+(2 \times 3)^{2}$
$+\ldots+(2 \times 10)^{2}$
$=\left(2^{2} \times 1^{2}\right)+\left(2^{2} \times 2^{2}\right)+\left(2^{2} \times 3^{2}\right)+\ldots+\left(2^{2} \times 10^{2}\right)$
$=2^{2} \times\left[1^{2}+2^{2}+3^{2}+\ldots+10^{2}\right]$
$\left[\right.$ Ref: $\left.\left(1^{2}+2^{2}+3^{2}+\ldots+n^{2}\right)={ }_{6}^{1} n(n+1)(2 n+1)\right]$
$=\left(4 \mathrm{x}_{6} \times 10 \times 11 \times 21\right)$
$=(4 \times 5 \times 77)$
$=1540$.

```
114. 854 x 854 x 854-276 x 276 x 276=?
    854 \times 854+854 \times 276 + 276 \times 276=?
    A. }1130\mathrm{ B. }57
    C. }56
    D. }115
E. None of these
```


## Answer: Option B

## Explanation:

Given Exp. $=\begin{aligned} & \left(a^{3}-b^{3}\right) \\ & \left(a^{2}+a b+b^{2}\right)\end{aligned}=(a-b)=(854-276)=578$
115. $35+15 \times 1.5=$ ?
A. 85
B. 51.5
C.57.5
D.5.25
E. None of these

## Answer: Option C

## Explanation:

Given Exp. $=35+153=3545=35+22.5=$ x $2+\quad 257.5$
116. The sum of first 45 natural numbers is:
A. 1035
B. 1280
C. 2070
D. 2140

## Answer: Option A

## Explanation:

Let $S_{n}=(1+2+3+\ldots+45)$
This is an A.P. in which $a=1, d=1, n=45$ and $l=45$
$\therefore \mathrm{S}_{\mathrm{n}}={ }_{2}^{n}(a+l)={ }_{2}^{45} \times(1+45)=(45 \times 23)=1035$
Required sum $=1035$.
117. $666 \div 6 \div 3=$ ?
A. 37
B. 333
C. 111
D. 84
E. None of these
_Answer: Option A
Explanation:
Given Exp. $=666 x_{6}^{1} x_{3}^{1}=37$
118. 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 $10,15,20,25, \ldots, 95$
This is an A.P. in which $a=10, d=5$ and $l=95$.
$\mathrm{t}_{\mathrm{n}}=95 \Rightarrow a+(n-1) d=95$
$\Rightarrow 10+(n-1) \times 5=95$
$\Rightarrow(n-1) \times 5=85$
$\Rightarrow(n-1)=17$
$\Rightarrow n=18$
$\therefore$ Requaired $\quad n(a+=18 \mathrm{x}(10+95)=(9 \mathrm{x}$
Sum $=\quad 2 l) \quad=2$ 105) $=945$.
119. 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 $=(700000-70)=699930$
120. 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:
Number $=269 \times 68+0=18292$
67) $18292(273$ 134
----
469
---201
---
1

Therefore, Required remainder $=1$
121. What is the unit digit in the product $\left(3^{65} \times 6^{59} \times 7^{71}\right)$ ?
A. 1
B. 2
C. 4
D. 6

## Explanation:

Unit digit in $3^{4}=1 \Rightarrow$ Unit digit in $\left(3^{4}\right)^{16}=1$
$\therefore$ Unit digit in $3^{65}=$ Unit digit in $\left[\left(3^{4}\right)^{16} \mathrm{x} 3\right]=(1 \mathrm{x}$
3) $=3$

Unit digit in $6^{59}=6$
Unit digit in $7^{4} \Rightarrow$ Unit digit in $\left(7^{4}\right)^{17}$ is 1 .
Unit digit in $7^{71}=$ Unit digit in $\left[\left(7^{4}\right)^{17} \times 7^{3}\right]=(1 \times 3)=$ 3.
$\therefore$ Required digit $=$ Unit digit in $(3 \times 6 \times 3)=4$.
123. $7589-?=3434$
A. 4242
B. 4155
C. 1123
D. 11023
E. None of these

Answer: Option B
Explanation:
Let $7589-x=3434$
Then, $x=7589-3434=4155$
124. $217 \times 217+183 \times 183=$ ?
A. 79698
B. 80578
C. 80698
D. 81268

Answer: Option B
Explanation:
$(217)^{2}+$
$(183)^{2}$

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

125. 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 $(4 \times 8 \times 7$
$\mathrm{x} 3)=(672)=2$
126. If the number $653 x y$ is divisible by 90 , then $(x+y)=$ ?
A. 2
B. 3
C. 4
D. 6

Answer: Option C

## Explanation:

$90=10 \times 9$
Clearly, 653xy is divisible by 10 , so $y=0$
Now, $653 x 0$ is divisible by 9 .
So, $(6+5+3+x+0)=(14+x)$ is divisible by 9 . So, $x$ $=4$.
Hence, $(x+y)=(4+0)=4$.
127. $3897 \times 999=$ ?
A. 3883203
B. 3893103
C. 3639403
D. 3791203
E. None of these

Answer: Option B
Explanation:
$3897 \times 999=3897 \times(1000-1)$

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

128. 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 $\left[\left(7^{4}\right)^{26} \times 7\right]$
But, unit digit in $\left(7^{4}\right)^{26}=1$
$\therefore$ Unit digit in $7^{105}=(1 \times 7)=7$
129. Which of the following numbers will completely divide $\left(4^{61}+4^{62}+4^{63}+4^{64}\right)$ ?
A. 3
B. 10
C. 11
D. 13

Answer: Option B

## Explanation:

$\left(4^{61}+4^{62}+4^{63}+4^{64}\right)=4^{61} \mathrm{x}\left(1+4+4^{2}+4^{3}\right)=4^{61} \mathrm{x}$ 85

$$
=4^{60} \times(4 \times 85)
$$

$=\left(4^{60} \times 340\right)$, which is divisible by 10 .
130. $106 \times 106-94 \times 94=$ ?
A. 2400
B. 2000
C. 1904
D. 1906
E. None of these

## Answer: Option A

## Explanation:

$106 \times 106-=(106)^{2}-(94)^{2}$
$94 \times 94$ $=(106+94)(106-94) \quad\left[\right.$ Ref: $\left(a^{2}-b^{2}\right)=$ $(a+b)(a-b)]$ $=(200 \times 12)$ $=2400$.
131. A number when divided successively by 4 and 5 leaves remainders 1 and 4 respectively. When it is successively divided by 5 and 4 , then the respective remainders will be
A.1, 2
B. 2,3
C. 3,2
D.4, 1

## Explanation:

```
\(4 \mid x \quad y=(5 \times 1+4)=9\)
5|y-1
    \(x=(4 \times y+1)=(4 \times 9+1)=37\)
    | 1 -4
```

Now, 37 when divided successively by 5 and 4 , we get
5 | 37
4|7-2
| 1-3
Respective remainders are 2 and 3.
132. $8796 \times 223+8796 \times 77=$ ?
A. 2736900
B. 2638800
C. 2658560
D. 2716740
E. None of these

## Answer: Option B

## Explanation:

$8796 \times 223+\quad=8796 \times(223+77) \quad$ [Ref: By
8796 x 77 Distributive Law]

$$
=(8796 \times 300)
$$

$$
\text { = } 2638800
$$

133. $8988 \div 8 \div 4=$ ?
A. 4494
B. 561.75
C. 2247
D. 280.875
E. None of these

## Answer: Option D

## Explanation:

Given Exp. $=8988 \mathrm{x}_{8}^{1} \mathrm{x}_{4}^{1}=\frac{2247}{8}=280.875$
134. $287 \times 287+269 \times 269-2 \times 287 \times 269=$ ?
A. 534
B. 446
C. 354
D. 324
E. None of these

## Answer: Option D

## Explanation:

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

$$
\begin{aligned}
& =(a-b)^{2}=(287-269)^{2} \\
& =\left(18^{2}\right) \\
& =324
\end{aligned}
$$

135. $3+33+333+3.33=$ ?
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
136. 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 nerver ends in 2 .
$\therefore 143642$ is not the square of natural number.
137. $(1000)^{9} \div 10^{24}=$ ?
A. 10000
B. 1000
C. 100
D. 10
E. None of these

Answer: Option B

## Explanation:

Given Exp. $(1000)^{9}$
$=\quad 10^{24}=$
$=$
$\left.10^{24}\right)^{3}=(10)^{27}=10^{(27-24)}=10^{3}=$
1000
138. $\left\{(476+424)^{2}-4 \times 476 \times 424\right\}=$ ?
A. 2906
B. 3116
C. 2704
D. 2904
E. None of these

## Answer: Option C

## Explanation:

Given $=\left[(a+b)^{2}-4 a b\right]$, where $a=476$ and $b=$
Exp. 424
$=\left[(476+424)^{2}-4 \times 476 \times 424\right]$
$=\left[(900)^{2}-807296\right]$
$=810000-807296$
$=2704$.

1. If one-third of one-fourth of a number is 15 , then threetenth of that number is:
A. 35
B. 36
C. 45
D. 54

Answer: Option D

## Explanation:

Let the number be $x$.
Then, ${ }_{3}^{1}{ }_{\text {of }}{ }_{4}^{1}$ of $x=15 \Leftrightarrow x=15 \times 12=180$.
So, required number $=\left(\begin{array}{ll}3 & x \\ 10^{x} & 180\end{array}\right)=54$.
2. Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is:
A. 9
B. 11
C. 13
D. 15

Answer: Option D

## Explanation:

Let the three integers be $x, x+2$ and $x+4$.
Then, $3 x=2(x+4)+3 \Leftrightarrow x=11$.
$\therefore$ Third integer $=x+4=15$.
3. The difference between a two-digit number and the number obtained by interchanging the positions of its digits is 36 . What is the difference between the two digits of that number?
A. 3
B. 4
C. 9
D.Cannot be determined
E. None of these

Answer: Option B

## Explanation:

Let the ten's digit be $x$ and unit's digit be $y$.
Then, $(10 x+y)-(10 y+x)=36$
$\Rightarrow 9(x-y)=36$
$\Rightarrow x-y=4$.
4. The difference between a two-digit number and the number obtained by interchanging the digits is 36 . What is the difference between the sum and the difference of the digits of the number if the ratio between the digits of the number is $1: 2$ ?
A. 4
B. 8
C. 16
D. None of these

## Answer: Option B

## Explanation:

Since the number is greater than the number obtained on reversing the digits, so the ten's digit is greater than the unit's digit.
Let ten's and unit's digits be $2 x$ and $x$ respectively.
Then, $(10 \mathrm{x} 2 x+x)-(10 x+2 x)=36$
$\Rightarrow 9 x=36$
$\Rightarrow x=4$.
$\therefore$ Required difference $=(2 x+x)-(2 x-x)=2 x=8$.
5. A two-digit number is such that the product of the digits is 8 . When 18 is added to the number, then the digits are reversed. The number is:
A. 18
B. 24
C. 42
D. 81

## Answer: Option B

## Explanation:

Let the ten's and unit digit be $x$ and ${ }_{x}^{8}$ respectively.
Then, $\left(10 x+{ }_{x}^{8}\right)+18=10 \mathrm{x}_{x}^{8}+x$
$\Rightarrow 10 x^{2}+8+18 x=80+x^{2}$
$\Rightarrow 9 x^{2}+18 x-72=0$
$\Rightarrow x^{2}+2 x-8=0$
$\Rightarrow(x+4)(x-2)=0$
$\Rightarrow x=2$.
6. The sum of the digits of a two-digit number is 15 and the difference between the digits is 3 . What is the two-digit number?
A. 69
B. 78
C. 96
D.Cannot be determined
E. None of these

## Answer: Option D

## Explanation:

Let the ten's digit be $x$ and unit's digit be $y$.
Then, $x+y=15$ and $x-y=3$ or $y-x=3$.
Solving $x+y=15$ and $x-y=3$, we get: $x=9, y=6$.
Solving $x+y=15$ and $y-x=3$, we get: $x=6, y=9$.
So, the number is either 96 or 69 .
Hence, the number cannot be determined.
7. The sum of the squares of three numbers is 138 , while the sum of their products taken two at a time is 131 . Their sum is:
A. 20
B. 30
C. 40
D.None of these

## _Answer: Option A

## Explanation:

Let the numbers be $a, b$ and $c$.
Then, $a^{2}+b^{2}+c^{2}=138$ and $(a b+b c+c a)=131$.
$(\mathrm{a}+\mathrm{b}+\mathrm{c})^{2}=a^{2}+b^{2}+c^{2}+2(a b+b c+c a)=138+2 \mathrm{x}$
$131=400$.
$\Rightarrow(a+b+c)=400=20$.
8. A number consists of two digits. If the digits interchange places and the new number is added to the original number, then the resulting number will be divisible by:
A. 3
B. 5
C. 9
D. 11
_Answer: Option D

## Explanation:

Let the ten's digit be $x$ and unit's digit be $y$.
Then, number $=10 x+y$.
Number obtained by interchanging the digits $=10 y+x$.
$\therefore(10 x+y)+(10 y+x)=11(x+y)$, which is divisible by 11.
9. In a two-digit, if it is known that its unit's digit exceeds its ten's digit by 2 and that the product of the given number and the sum of its digits is equal to 144 , then the number is:
A. 24
B. 26
C. 42
D. 46

Answer: Option A

## Explanation:

Let the ten's digit be $x$.
Then, unit's digit $=x+2$.
Number $=10 x+(x+2)=11 x+2$.
Sum of digits $=x+(x+2)=2 x+2$.
$\therefore(11 x+2)(2 x+2)=144$
$\Rightarrow 22 x^{2}+26 x-140=0$
$\Rightarrow 11 x^{2}+13 x-70=0$
$\Rightarrow(x-2)(11 x+35)=0$
$\Rightarrow x=2$.
Hence, required number $=11 x+2=24$.
10. Find a positive number which when increased by 17 is equal to 60 times the reciprocal of the number.
A. 3
B. 10
C. 17
D. 20

Answer: Option A

## Explanation:

Let the number be $x$.
Then, $x+17={ }_{x}^{60}$
$\Rightarrow x^{2}+17 x-60=0$
$\Rightarrow(x+20)(x-3)=0$
$\Rightarrow x=3$.

1. The product of two numbers is 9375 and the quotient, when the larger one is divided by the smaller, is 15 . The sum of the numbers is:
A. 380
B. 395
C. 400
D. 425

## Answer: Option C

## Explanation:

Let the numbers be $x$ and $y$.
Then, $x y=9375$ and $_{y}^{x}=15$.
xy _9375
$(x / y)^{=} 15$
$\Rightarrow y^{2}=625$.
$\Rightarrow y=25$.
$\Rightarrow x=15 y=(15 \times 25)=375$.
$\therefore$ Sum of the numbers $=x+y=375+25=400$.
12. The product of two numbers is 120 and the sum of their squares is 289 . The sum of the number is:
A. 20
B. 23
C. 169
D.None of these

## Answer: Option B

## Explanation:

Let the numbers be $x$ and $y$.
Then, $x y=120$ and $x^{2}+y^{2}=289$.
$\therefore(x+y)^{2}=x^{2}+y^{2}+2 x y=289+(2 \times 120)=529$
$\therefore x+y=529=23$.
13. A number consists of 3 digits whose sum is 10 . The middle digit is equal to the sum of the other two and the number will be increased by 99 if its digits are reversed. The number is:
A. 145
B. 253
C. 370
D. 352

Answer: Option B

## Explanation:

Let the middle digit be $x$.
Then, $2 x=10$ or $x=5$. So, the number is either 253 or 352.

Since the number increases on reversing the digits, so the hundred's digits is smaller than the unit's digit. Hence, required number $=253$.
14. The sum of two number is 25 and their difference is 13 . Find their product.
A. 104
B. 114
C. 315
D. 325

## Answer: Option B

## Explanation:

Let the numbers be $x$ and $y$.
Then, $x+y=25$ and $x-y=13$.
$4 x y=(x+y)^{2}-(x-y)^{2}$
$=(25)^{2}-(13)^{2}$
$=(625-169)$
$=456$
$\therefore x y=114$.
15. What is the sum of two consecutive even numbers, the difference of whose squares is 84 ?
A. 34
B. 38
C. 42
D. 46

Answer: Option C

## Explanation:

Let the numbers be $x$ and $x+2$.
Then, $(x+2)^{2}-x^{2}=84$
$\Rightarrow 4 x+4=84$
$\Rightarrow 4 x=80$
$\Rightarrow x=20$.
$\therefore$ The required sum $=x+(x+2)=2 x+2=42$.

## SIMPLIFICATION

## 1. 'BODMAS' Rule:

This rule depicts the correct sequence in which the operations are to be executed, so as to find out the value of given expression.
Here B-Bracket,
O - of,
D - Division,
M - Multiplication,
A - Addition and
S - Subtraction
Thus, in simplifying an expression, first of all the brackets must be removed, strictly in the order (), $\}$ and $\|$.
After removing the brackets, we must use the following operations strictly in the order:
(i) of (ii) Division (iii) Multiplication (iv) Addition (v)

Subtraction.
2. Modulus of a Real Number:

Modulus of a real number $a$ is defined as

$$
|a|=\left\{\begin{array}{l}
a, \text { if } a>0 \\
-a, \text { if } a<0
\end{array}\right.
$$

Thus, $|5|=5$ and $|-5|=-(-5)=5$.
3. Virnaculum (or Bar):

When an expression contains Virnaculum, before applying the 'BODMAS' rule, we simplify the expression under the Virnaculum.

1. A man has Rs. 480 in the denominations of one-rupee notes, five-rupee notes and ten-rupee notes. The number of notes of each denomination is equal. What is the total number of notes that he has ?

| A. 45 | $\underline{\text { B. } 60}$ |
| :--- | :--- |
| C. 75 | $\underline{\text { D. } 90}$ |

## Answer: Option D

## Explanation:

Let number of notes of each denomination be $x$.
Then $x+5 x+10 x=480$
$\Rightarrow 16 x=480$
$\therefore x=30$.
Hence, total number of notes $=3 x=90$.
2. There are two examinations rooms A and B. If 10
students are sent from A to B, then the number of students in each room is the same. If 20 candidates are sent from B to A , then the number of students in A is double the number of students in $B$. The number of students in room A is:
A. 20
B. 80
C. 100
D. 200

## Answer: Option C

## Explanation:

Let the number of students in rooms A and B be $x$ and $y$ respectively.
Then, $x-10=y+10 \Rightarrow x-y=20 \ldots$ (i)
and $x+20=2(y-20) \Rightarrow x-2 y=-60 \ldots$ (ii)
Solving (i) and (ii) we get: $x=100, y=80$.
$\therefore$ The required answer A $=100$.
3. The price of 10 chairs is equal to that of 4 tables. The price of 15 chairs and 2 tables together is Rs. 4000 . The total price of 12 chairs and 3 tables is:
A.Rs. 3500
B.Rs. 3750
C.Rs. 3840
D.Rs. 3900

## Answer: Option D

## Explanation:

Let the cost of a chair and that of a table be Rs. $x$ and Rs. $y$ respectively.
Then, $10 x=4 y$ or $y={ }_{2}^{5} x$.
$\therefore 15 x+2 y=4000$
$\Rightarrow 15 x+2 \mathrm{x}_{2}^{5} x=4000$
$\Rightarrow 20 x=4000$
$\therefore x=200$.
So, $y=\binom{5}{2^{\mathrm{x}} 200}=500$.
Hence, the cost of 12 chairs and 3 tables $=12 x+3 y$
=Rs. $(2400+1500)$
= Rs. 3900 .
4. If $a-b=3$ and $a^{2}+b^{2}=29$, find the value of $a b$.
A. 10
B. 12
C. 15
D. 18

Answer: Option A

## Explanation:

$$
\begin{aligned}
& 2 a b=\left(a^{2}+b^{2}\right)-(a-b)^{2} \\
& =29-9=20 \\
& \Rightarrow a b=10 .
\end{aligned}
$$

5. The price of 2 sarees and 4 shirts is Rs. 1600 . With the same money one can buy 1 saree and 6 shirts. If one wants to buy 12 shirts, how much shall he have to pay ?
A.Rs. 1200
B.Rs. 2400
C.Rs. 4800
D.Cannot be determined
E. None of these

## Answer: Option B

## Explanation:

Let the price of a saree and a shirt be Rs. $x$ and Rs. $y$ respectively.
Then, $2 x+4 y=1600 \ldots$.... (i)
and $x+6 y=1600$
Divide equation (i) by 2 , we get the below equation.
$=>x+2 y=800$. --- (iii)
Now subtract (iii) from (ii)
$x+6 y=1600(-)$
$x+2 y=800$
$4 y=800$

Therefore, $\mathrm{y}=200$.
Now apply value of y in (iii)
$=>x+2 \times 200=800$
$\Rightarrow>+400=800$
Therefore $\mathrm{x}=400$
Solving (i) and (ii) we get $x=400, y=200$.
$\therefore$ Cost of 12 shirts $=$ Rs. $(12 \times 200)=$ Rs. 2400.
6. A sum of Rs. 1360 has been divided among A, B and C such that A gets $\frac{2}{3}$ of what B gets and B gets $\frac{1}{4}$ of what C gets. B's share is:
A.Rs. 120
B.Rs. 160
C.Rs. 240
D.Rs. 300

## Answer: Option C

## Explanation:

Let C's share $=$ Rs. $x$
Then, B's share $=$ Rs. $\begin{gathered}x \\ ,\end{gathered}$ A's share $=$ Rs. $\binom{2 x}{3^{x} 4}=\begin{array}{r}x \\ R_{6}\end{array}$
$\therefore \frac{x}{6}+\frac{x}{4}+x=1360$
$\Rightarrow{ }_{12}^{17 x}=1360$
$\Rightarrow x=\frac{1360 \times 12}{17}=$ Rs. 960
Hence, B's share $=$ Rs. $\binom{960}{4}=$ Rs. 240.
7. One-third of Rahul's savings in National Savings

Certificate is equal to one-half of his savings in Public
Provident Fund. If he has Rs. 1,50,000 as total savings, how much has he saved in Public Provident Fund ?
A.Rs. 30,000
B.Rs. 50,000
C.Rs. 60,000
D.Rs. 90,000

## Answer: Option C

## Explanation:

Let savings in N.S.C and P.P.F. be Rs. $x$ and Rs. (150000
$-x$ ) respectively. Then,
$1_{3}^{x}=\frac{1}{2}(150000-x)$
$\Rightarrow{ }_{3}^{x}+\frac{x}{2}=75000$
$\Rightarrow{ }_{6}^{5 x}=75000$
$\Rightarrow x={ }_{5}^{75000 \times 6}=90000$
$\therefore$ Savings in Public Provident Fund = Rs. (150000 90000) = Rs. 60000
8. A fires 5 shots to B's 3 but A kills only once in 3 shots while B kills once in 2 shots. When B has missed 27 times, A has killed:
A. 30 birds
B. 60 birds
C. 72 birds
D. 90 birds

## Answer: Option A

## Explanation:

Let the total number of shots be $x$. Then,
Shots fired by A $={ }_{8}^{5} X$
Shots fired by B $={ }_{8}^{3} x$
Killing shots by $\mathrm{A}={ }_{3}^{1}{ }_{0} \mathrm{ff}_{8}^{5} x={ }_{24}{ }^{x}$
Shots missed by $B={ }_{2}^{1}{ }_{2}{ }_{8}^{3} x={ }^{x}{ }_{16}{ }^{x}$
$\therefore \begin{aligned} & 3 x \\ & 16\end{aligned}=27$ or $x=\binom{27 \mathrm{x} 16}{3}=144$.
Birds killed by A $=\frac{5 x}{24}=\binom{5}{24^{\mathrm{X}} 144}=30$.
9. Eight people are planning to share equally the cost of a rental car. If one person withdraws from the arrangement and the others share equally the entire cost of the car, then the share of each of the remaining persons increased by:

| A. $_{7}^{1}$ | B. ${ }_{8}^{1}$ |
| :---: | :---: |
| C. ${ }_{9}$ | $\square_{\text {D. }}{ }_{8}^{7}$ |

_Answer: Option A

## Explanation:

Original share of 1 person $=\frac{1}{8}$
New share of 1 person $=\frac{1}{7}$
Increase $=\left(\begin{array}{ll}1 & 1 \\ 7^{-} & 8\end{array}\right)=\begin{aligned} & 1 \\ & 56\end{aligned}$
$\therefore$ Required fraction $=(1 / 56)=\left(\begin{array}{ll}1 & 8 \\ 56^{\mathrm{X}} & 1\end{array}\right)=\begin{aligned} & 1 \\ & 7\end{aligned}$
10. To fill a tank, 25 buckets of water is required. How many buckets of water will be required to fill the same tank if the capacity of the bucket is reduced to two-fifth of its present?
A. 10
B. 35
C. 62.5
E. None of these

> D.Cannot be determined

Answer: Option C

## Explanation:

Let the capacity of 1 bucket $=x$.
Then, the capacity of tank $=25 x$.
New capacity of bucket $={ }_{5}^{2} x$
$\therefore$ Required number of buckets $=\begin{gathered}25 x \\ (2 x / 5)\end{gathered}$
$=\binom{{ }^{5}}{25 x^{\mathrm{x}}}$
$={ }_{2}^{125}$
$=62.5$
11. In a regular week, there are 5 working days and for each day, the working hours are 8. A man gets Rs. 2.40 per hour for regular work and Rs. 3.20 per hours for overtime. If he earns Rs. 432 in 4 weeks, then how many hours does he work for ?
A. 160
B. 175
C. 180
D. 195

## Answer: Option B

## Explanation:

Suppose the man works overtime for $x$ hours.
Now, working hours in 4 weeks $=(5 \times 8 \times 4)=160$.
$\therefore 160 \times 2.40+x \times 3.20=432$
$\Rightarrow 3.20 x=432-384=48$
$\Rightarrow x=15$.
Hence, total hours of work $=(160+15)=175$.
12. Free notebooks were distributed equally among children of a class. The number of notebooks each child got was one-eighth of the number of children. Had the number of children been half, each child would have got 16 notebooks. Total how many notebooks were distributed ?
A. 256
B. 432
C. 512
D. 640
E. None of these

## Answer: Option C

## Explanation:

Let total number of children be $x$.
Then, $x \mathrm{x}_{8}^{1} x={ }_{2}^{x} \mathrm{x} 16 \Leftrightarrow x=64$.
$\therefore$ Number of notebooks $={ }_{8}^{1} x^{2}=\left(\begin{array}{l}1 \\ 8\end{array} \quad 64 \times 64\right)=512$.
13. A man has some hens and cows. If the number of heads be 48 and the number of feet equals 140 , then the number of hens will be:
A. 22
B. 23
C. 24
D. 26

## Explanation:

Let the number of hens be $x$ and the number of cows be $y$.
Then, $x+y=48$.... (i)
and $2 x+4 y=140 \Rightarrow x+2 y=70 \ldots$ (ii)
Solving (i) and (ii) we get: $x=26, y=22$.
$\therefore$ The required answer $=26$.

$$
\begin{aligned}
& \text { 14. }(469+174)^{2}-(469-174)^{2}=\text { ? } \\
& \text { (469 x 174) } \\
& \underset{-1}{\text { A. } 2} \quad \underset{\text { B. } 4}{ } \\
& \text { C. } 295 \\
& \text { D. } 643
\end{aligned}
$$

## Answer: Option B

Explanation:
Given exp. $=\begin{aligned} & (a b+b)^{2}-(a-b)^{2} \\ & a b\end{aligned}$

$$
\begin{aligned}
& =4 a b \\
& =a b \\
& =4 \text { (where } a=469, b=174 . \text { ) }
\end{aligned}
$$

15. David gets on the elevator at the $11^{\text {th }}$ floor of a building and rides up at the rate of 57 floors per minute. At the same time, Albert gets on an elevator at the 51st floor of the same building and rides down at the rate of 63 floors per minute. If they continue travelling at these rates, then at which floor will their paths cross ?
A. 19
B. 28
C. 30
D. 37

## Answer: Option C

## Explanation:

Suppose their paths cross after $x$ minutes.
Then, $11+57 x=51-63 x \quad \Leftrightarrow \quad 120 x=40$
$x=\frac{1}{3}$
$\begin{aligned} & \text { Number of floors covered by David in } \\ & (1 / 3) \text { min. }=\end{aligned} \quad\binom{1_{\mathrm{X}}}{357}=$
So, their paths cross at $(11+19)$ i.e., $30^{\text {th }}$ floor.

## Answer: Option D

