Problems on Numbers - Solved Examples(Set 2)

51. The difference of the squares of two consecutive even integers is always divisible by

A. 3	B. 6
C. 4	D. 7

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answer with explanation

Answer: Option C

Explanation:

Let the consecutive even integers be n and (n + 2)

difference of the squares
$= (n + 2)^2 - n^2$
$= (n^2 + 4n + 4) - n^2$
$= 4n + 4$
$= 4(n + 1)$ which is always divisible by 4

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

A. 115909	B. 115919
C. 115939	D. 115929

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answer with explanation

Answer: Option D

Explanation:

If a number is divisible by two co-prime numbers, then the number is divisible by their product also.

If a number is divisible by more than two pairwise co-prime numbers, then the number is divisible by their product also. (read more)

If a number is divisible by another number, then it is also divisible by all the factors of that number. (read more)

We know that $99 = 9 \times 11$ where 9 and 11 are co-prime numbers. Also, 9 and 11 are factors of 99. Hence,
(1) If a number is divisible by 9 and 11, the number will be divisible by their product 99 also.
(2) If a number is not divisible by 9 or 11, it is not divisible by 99

Using divisibility rules, we can find out whether a given number is divisible by another number without actually performing the division.

115929 is divisible by both 9 and 11
=> 115929 is divisible by 99

115939 is not divisible by 9
=> 115939 is not divisible by 99

115919 is not divisible by 9
=> 115919 is not divisible by 99

115909 is not divisible by 9
=> 115909 is not divisible by 99

Hence, 115929 is the answer

53. 612×612×612+321×321×321612×612−612×321+321×321=?

A. 933 B. 1000
C. 712 D. 843

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answer with explanation

Answer: Option A

Explanation:

a3+b3=(a+b)(a2−ab+b2)

(read more)

Given Equation is in the form (a3+b3)(a2−ab+b2)

where a=612 and b=321

(a3+b3)(a2−ab+b2)=(a+b)(a2−ab+b2)(a2−ab+b2)=(a+b)

Hence answer =(a+b)=612+321=933

54. How many terms are there in the G.P. 4, 8, 16, 32, ... , 1024?
A. 9 B. 8

C. 7 D. 6

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answer with explanation

Answer: Option A

Explanation:

nth term of a geometric progression (GP)tn=arn−1

where tn=nth term, a = the first term , r = common ratio, n = number of terms (read more)

a=4r=84=2tn=1024

tn=arn−1⇒1024=4×2n−1⇒2n−1=10244=256=28⇒2n−1=28⇒n−1=8⇒n=8+1=9

55. 123×123+288×288+2×123×288=?

A. 168151 B. 178121
C. 168921 D. 162481

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Notebook

answer with explanation

Answer: Option C

Explanation:

(a+b)2=a2+2ab+b2

read more...

123×123+288×288+2×123×288=(123+288)2=4112=168921

56. If a number is divided by 6 , 3 is the remainder . What is the remainder if the the square of the number is divided by 6?

A. 5 B. 4

C. 3 D. 2

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answer with explanation

Answer: Option C

Explanation:

if the number is divided by 6 , 3 is the remainder
Therefore, number =6k+3

Square of the number
=(6k+3)2
=36k2+36k+9 [∵(a+b)2=a2+2ab+b2]
=36k2+36k+6+3=6(6k2+6k+1)+3

Hence, when the square of the number is divided by 6, we get 3 as remainder.

57. In a division, the remainder is 0 when a student mistook the divisor as 12 instead of 21 and obtained 35 as quotient. What is the correct quotient ?

A. 25 B. 20
C. 15 D. 10

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answer with explanation

Answer: Option B

Explanation:

Let x

be the number
x÷12=35, remainder = 0
=> x=35×12

correct quotient
=x21=35×1221=5×123=5×4=20

58. 1531×132+1531×68=?

A. 306000 B. 306100
C. 306200 D. 306400
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Notebook
answer with explanation

Answer: Option C

Explanation:

a(b+c)=ab+ac
(distributive Law)
(read more)

1531×132+1531×68=1531(132+68)=1531×200=306200

59. 100010÷1028=?

A. 10 B. 100
C. 1000 D. 10000
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answer with explanation

Answer: Option B

Explanation:

(am)n=amn=(an)m

am.an=am+n

aman=am−n

read more...

1000101028=(103)101028=10301028=102=100

60. 2+22+222+2.22=?

A. 246 B. 248

C. 248.12 D. 248.22

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answer with explanation

Answer: Option D

61. Which of the following numbers will completely divide (4915−1)?

A. 14 B. 46

C. 8 D. 50

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Notebook

answer with explanation

Answer: Option C

Explanation:

Solution 1

(xn−an)
is completely divisible by (x−a)
for every natural number n

read more...

(4915−1)=(4915−115)

which is divisible by (49 - 1) = 48

Since 8 is a factor of 48, (4915−1)

is also divisible by 8

Solution 2

(xn−an)
is completely divisible by (x+a)
when n is even

read more...

(4915−1)=[(72)15−1]=(730−1)=(730−130)

which is completely divisible by (7 + 1) = 8

62. How many even prime numbers are there less than 50?

A. 1 B. 15

C. 2 D. 16

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Notebook

answer with explanation

Answer: Option A

Explanation:

2 is the only even prime number

63. How many prime numbers are there less than 50?

A. 13 B. 14

C. 15 D. 16

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answer with explanation

Answer: Option C

Explanation:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47 are the prime numbers less than 50

64. What is the difference between local value and face value of 7 in the numeral 657903?

A. 6993 B. 69993

C. 7000 D. 7

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answer with explanation

Answer: Option A

Explanation:

(Local value of 7) - (Face value of 7)
= (7000 - 7) = 6993

65. $108+109+110+\cdots+202=?$

A. 14615 B. 14625

C. 14715 D. 14725

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answer with explanation

Answer: Option D

Explanation:

Solution 1

Number of terms of an arithmetic progression

n=(l−a)d+1

where n = number of terms, a= first term , l = last term, d = common difference

Sum of first n terms in an arithmetic progression

Sn=n2[2a+(n−1)d]=n2(a+l)

where a = the first term, d = common difference,

l=tn=nth term =a+(n−1)d

(read more)

a=108l=202d=109−108=1

n=l−ad+1=202−1081+1=94+1=95 Sn=n2(a+l)=952(108+202)=95×3102=95×155=14725

Solution 2

1+2+3+⋯+n

=∑n=n(n+1)2

(Reference: Power Series)

108+109+110+⋯+202

=(1+2+3+⋯+202) −(1+2+3+⋯+107)

=(202×2032)−(107×1082) =(101×203)−(107×54) =20503−5778 =14725

66. $23732 \times 999 = ?$

A. 23708268 B. 22608258
C. 22608268 D. 23708258

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answer with explanation

Answer: Option A

Explanation:

$23732 \times 999 = 23732(1000 - 1) = 23732 \times 1000 - 23732 \times 1 = 23732000 - 23732 = 23708268$

please go through speed maths methods to do calculations faster.

67. $123427201 - ? = 568794$

A. 123527207 B. 223521407
C. 123527407 D. 122858407

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Notebook

answer with explanation

Answer: Option D

Explanation:

Let $123427201 - x = 568794$

$x = 123427201 - 568794 = 122858407$

68. $2210 \times ? = 884$

A. 23
B. 25

C. 15
D. 34

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Notebook
answer with explanation

Answer: Option B

Explanation:

Let 2210 ×x=884

x=8842210=4421105=3485=25

69. If P and Q are odd numbers, then which of the following is even?

A. P + Q B. PQ
C. P + Q + 1 D. PQ + 2

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Notebook
answer with explanation

Answer: Option A

Explanation:

The sum of two odd numbers is an even number. (read more)

Hence P + Q is an even number

or

Just take any two odd numbers, say 1 and 3

P + Q = 1 + 3 = 4 = an even number
P + Q + 1 = 1 + 3 + 1 = 5 = an odd number
PQ = 1 × 3 = 3 = an odd number
PQ + 2 = (1 × 3) + 2 = 5 = an odd number

Hence P + Q is the answer

70. Which of the following numbers will completely divide (319+320+321+322)
?

A. 25 B. 16
C. 11 D. 12

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Notebook
answer with explanation

Answer: Option D

Explanation:

319+320+321+322=319(1+3+32+33)=319×40=318×3×4×10=318×12×10

which is divisible by 12

71. What is the largest 5 digit number exactly divisible by 94?

A. 99922 B. 99924
C. 99926 D. 99928

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answer with explanation

Answer: Option A

Explanation:

Largest 5 digit number = 99999

99999 ÷ 94 = 1063, remainder = 77

Hence largest 5 digit number exactly divisible by 94
= 99999 - 77 = 99922

72. What is the smallest 5 digit number exactly divisible by 94?

A. 10052 B. 10054
C. 10056 D. 10058

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Notebook
answer with explanation

Answer: Option D

Explanation:

Smallest 5 digit number = 10000

10000 ÷ 94 = 106, remainder = 36
94 - 36 = 58.

i.e., 58 should be added to 10000 to make it divisible by 94.
Therefore, smallest 5 digit number exactly divisible by 94
= 10000 + 58 = 10058

73. 1234 - ? = 4234 - 3361

A. 351 B. 361

C. 371 D. 379

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Notebook

answer with explanation

Answer: Option B

Explanation:

Let $1234-x=4234-3361$

$x=1234-4234+3361=361$

74. 320 ÷ 2 ÷ 3 = ?

A. None of these B. 53.33

C. 160 D. 106

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Notebook

answer with explanation

Answer: Option B

Explanation:

$320\div2\div3=160\div3=53.33$

or

$320\div2\div3=320\times12\times13=1603=53.33$

75. 476**0 is divisible by both 3 and 11. What are the non-zero digits in the hundred's and ten's places respectively?

A. 8 and 5 B. 6 and 5

C. 8 and 2 D. 6 and 2

Hide Answer

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Notebook

answer with explanation

Answer: Option A

Explanation:

References

1. Divisibility by 3

2. Divisibility by 11

Solution 1

Just substitute the values in the missing places and apply divisibility rules.

if a=6 and b=2, number = 476620

4 + 7 + 6 + 6 + 2 + 0 = 25 which is not divisible by 3

Hence 476620 is not divisible by 3

if a=8 and b=2, number = 476820

4 + 7 + 6 + 8 + 2 + 0 = 27 which is divisible by 3

Hence 476820 is divisible by 3

4 + 6 + 2 = 12

7 + 8 + 0 = 15

15 - 12 = 3

Hence 476820 is not divisible by 11

if a=6 and b=5, number = 476650

4 + 7 + 6 + 6 + 5 + 0 = 28 which is not divisible by 3

Hence 476650 is not divisible by 3

if a=8 and b=5, number = 476850

4 + 7 + 6 + 8 + 5 + 0 = 30 which is divisible by 3

Hence 476850 is divisible by 3

4 + 6 + 5 = 15

7 + 8 + 0 = 15

15 - 15 = 0

Hence 476850 is divisible by 11

So a=8 and b=5 is the answer

Solution 2

Let the number be 476ab0

476ab0 is divisible by 3
=> 4 + 7 + 6 + a + b + 0 is divisible by 3
=> 17 + a + b is divisible by 3 ...(equation 1)

476ab0 is divisible by 11
=> (4+6+b)-(7+a+0) is 0 or divisible by 11
=> 3+(b-a) is 0 or divisible by 11 ...(equation 2)

Substitute the values of a and b with the values given in the choices and select the values which satisfies both equation 1 and 2.

if a=6 and b=2,
17 + a + b = 17 + 6 + 2 = 25 which is not divisible by 3.
Does not meet equation 1

if a=8 and b=2,
17 + a + b = 17 + 8 + 2 = 27 which is divisible by 3.
Meet equation 1
3+(b-a) = 3+(2-8) = -3 which is neither 0 nor divisible by 11
Does not meet equation 2

if a=6 and b=5,
17 + a + b = 17 + 6 + 5 = 28 which is not divisible by 3
Does not meet equation 1

if a=8 and b=5,
17 + a + b = 17 + 8 + 5 = 30 which is divisible by 3
Meet equation 1
3+(b -a) = 3+(5-8) = 0
Meet equation 2
Since these values satisfies both equation 1 and equation 2, this is the answer

76. On dividing 2272 as well as 875 by 3-digit number N, we get the same remainder. What is the sum of the digits of N?

A. 11	B. 10
C. 9	D. 8

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Notebook

answer with explanation

Answer: Option B

Explanation:

Let 2272 ÷ N = a, remainder = r
=> 2272 = Na + r ...(1)

Let 875 ÷ N = b, remainder = r
=> 875 = Nb + r ...(2)

(1)-(2)
=> 2272 - 875 = [Na + r] - [Nb + r]
=> 1397 = NA - Nb
=> 1397 = N(a - b) ...(3)

It means 1397 is divisible by N

But 1397 = 11 × 127
(References: factors of a number, prime factorization)

You can see that 127 is the only 3 digit number which perfectly divides 1397
=> N = 127

Sum of the digits of N
= 1 + 2 + 7 = 10

77. What is the sum of first ten prime numbers?

A. 55 B. 101

C. 130 D. 129

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Notebook
answer with explanation

Answer: Option D

Explanation:

(Reference : Prime Numbers)

Required Sum = 2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 + 23 + 29 = 129

78. Which f the following numbers is exactly divisible by 11?

A. 499774 B. 47554

C. 466654 D. 4646652

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Notebook

answer with explanation

Answer: Option A

Explanation:

Reference : Divisibility by 11 Rule

Take 47554
4 + 5 + 4 = 13
7 + 5 = 12
13 - 12 = 1
1 is not divisible by 11
Hence 47554 is not divisible by 11

Take 466654
4 + 6 + 4 = 14
6 + 5 = 11
14 - 11 = 3
3 is not divisible by 11
Hence 466654 is not divisible by 11

Take 4646652
4 + 4 + 6 + 2 = 16
6 + 6 + 5 = 17
17 - 16 = 1
1 is not divisible by 11
Hence 4646652 is not divisible by 11

Take 499774
4 + 9 + 7 = 20
9 + 7 + 4 = 20
20 - 20 = 0
We got the difference as 0.
Hence 499774 is divisible by 11

79. What is the sum all even natural numbers between 1 and 101?

A. 5050 B. 2550

C. 5040 D. 2540

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Notebook
answer with explanation

Answer: Option B

Explanation:

Reference 1: Natural Numbers
Reference 2: Arithmetic Progression (AP) and Related Formulas

Required sum = 2 + 4 + 6+ . . . + 100

This is an arithmetic progression with
a = 2
d = (4 - 2) = 2

n=(l−a)d+1=(100−2)2+1=982+1=49+1=50

2+4+6+⋯+100=n2(a+l)=502(2+100)=502(102)=50×51=2550

80. A boy multiplies 987 by a certain number and obtained 559981 as his answer. If in the answer both 9 are wrong , but the other digits are correct, then what will be the correct answer?

A. 556581
B. 555681
C. 555181
D. 553681

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answer with explanation

Answer: Option B

Explanation:

Solution 1

The answer is divisible by 987. So we can use hit and trial method to find out the number divisible by 987 from the given choices.

553681 ÷ 987 gives a remainder not equal to 0
555181 ÷ 987 gives a remainder not equal to 0
556581 ÷ 987 gives a remainder not equal to 0
But 555681 ÷ 987 gives 0 as remainder. Hence this is the answer

Solution 2

If a number is divisible by two co-prime numbers, then the number is divisible by their product also.

If a number is divisible by more than two pairwise co-prime numbers, then the number is divisible by their product also. (read more)

If a number is divisible by another number, then it is also divisible by all the factors of that number. (read more)

The answer is divisible by 987.
987 = 3 × 7 × 47 (prime factorization)
Here 3, 7 and 47 are pairwise co-prime numbers.
Also 3, 7 and 47 are factors of 987. Hence
(1) If a number is divisible by 3, 7 and 47, the number will be divisible by their product 987 also.
(2) If a number is not divisible by 3 or 7 or 47, it is not divisible by 987

Using divisibility rules, we can find out whether a given number is divisible by another number without actually performing the division.

556581 is divisible by 3
556581 is not divisible by 7
Hence 556581 is not divisible by 987

555181 is not divisible by 3
Hence 555181 is not divisible by 987

553681 is not divisible by 3
Hence 553681 is not divisible by 987

555681 is divisible by 3
555681 is divisible by 7
555681 is divisible by 47
Hence 555681 is divisible by 987

81. Which one of the following cannot be the square of a natural number ?

A. 15186125824	B. 49873162329
C. 14936506225	D. 60625273287

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Notebook
answer with explanation

Answer: Option D

Explanation:

Square of a natural number cannot end with 7. Hence 60625273287 is the answer

82. 7128+1252=1202+?

A. 6028 B. 1248
C. 2348 D. 7178

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Notebook
answer with explanation

Answer: Option D

Explanation:

?=7128+1252−1202=7128+50=7178

83. 3+32+33+⋯+38=?

A. 9820 B. 9240
C. 9840 D. 9220

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Notebook
answer with explanation

Answer: Option C

Explanation:

Sum of first n terms in a geometric progression (GP)

Sn=⎧⎪⎪⎪⎪⎪⎨⎪⎪⎪⎪⎪⎩a(rn−1)r−1 (if r > 1)a(1−rn)1−r (if r < 1)

where a= the first term , r = common ratio, n = number of terms

(read more)

This is a Geometric Progression (GP) where
a = 3
r = 323=3
n = 8

$Sn=a(rn-1)r-1$ $=3(38-1)3-1$ $=3(6561-1)2$ $=3\times65602=3\times3280=9840$

84. $73411\times9999=?$

A. 724836589 B. 724036589
C. 734036589 D. 734036129

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Notebook
answer with explanation

Answer: Option C

Explanation:

$73411\times9999=73411(10000-1)=734110000-73411=734036589$

85. $32+33+34+\cdots+42=?$

A. 397 B. 407
C. 417 D. 427

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Notebook
answer with explanation

Answer: Option B

Explanation:

Solution 1

Number of terms of an arithmetic progression
$n=(l-a)d+1$

where n = number of terms, a= the first term , l = last term, d= common difference

Sum of first n terms in an arithmetic progression
$Sn=n2[2a+(n-1)d]=n2(a+l)$
where a = the first term, d= common difference,
$l=tn=n^{th}$ term $=a+(n-1)d$

(read more)

$a=32 l=42 d=33-32=1$

$n=(l-a)d+1=42-321+1=10+1=11$

$Sn=n2(a+l)=112(32+42)=11\times742=11\times37=407$

Solution 2

$1+2+3+\cdots+n$
$=\sum n=n(n+1)2$

[(Reference: Power Series)]

$32+33+34+\cdots+42$

$=(1+2+3+\cdots+42)-(1+2+3+\cdots+31)$

$=(42\times432)-(31\times322)=21\times43-31\times16=903-496=407$

86. What is the digit in the unit place of the number represented by $(795-358)$

A. 4 B. 3
C. 2 D. 1

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Notebook

answer with explanation

Answer: Option A

Explanation:

Let's first find out the unit digit of 795

$795=(74)23\times73$
Hence, unit digit of 795
= unit digit of (74)23 × unit digit of 73 **...(1)**

unit digit of (74)23

= unit digit of (7×7×7×7)23
= unit digit of (9×9)23 (∵ 7×7=49 and 9 is the unit digit of 49)
= unit digit of 123 (∵ 9×9=81 and 1 is the unit digit of 81)
= 1 **...(2)**

unit digit of 73
= unit digit of (7×7×7)
= unit digit of (9×7)(∵ 7 × 7 = 49 and 9 is the unit digit of 49)
= 3 **...(3)**(∵ 9 × 7 = 63 and 3 is the unit digit of 63)

from (1),(2) and (3),
unit digit of 795=1×3=3 **...(A)**

Similarly we can find out unit digit of 358
358=(34)14×32
Hence, unit digit of 358
= unit digit of (34)14 × unit digit of 32 **...(4)**

unit digit of (34)14
= unit digit of (3×3×3×3)14
= unit digit of (9×9)14(∵ 3×3=9)
= unit digit of 114 (∵ 9×9=81 and 1 is the unit digit of 81)
= 1 **...(5)**

unit digit of 32=9 **...(6)**

Hence from (4),(5) and (6),
unit digit of 358=1×9=9 **...(B)**

We have already found out that
unit digit of 795=3 (from A)
and unit digit of 358=9 (from B)

Hence, unit digit of (795−358)
= unit digit of 795 - unit digit of 358
= unit digit of [larger number of last digit 3 - smaller number of last digit 9](∵795>358)

= 4 (∵ 4 is the unit digit when a smaller number of last digit 9 is subtracted from a larger number of last digit 3. example : 113 - 19 = 94)

87. What is the unit digit in the number represented by 365×659×771

A. 1 B. 2

C. 3 D. 4
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Notebook
answer with explanation

Answer: Option D

Explanation:

Let's first find out the unit digit of 365

365=(34)16×3

Hence, unit digit of 365
= unit digit of [(34)16×3]
= unit digit of [(3×3×3×3)16×3]
= unit digit of [(9×9)16×3] (∵ 3×3=9)
= unit digit of [116×3] (∵ 9×9=81 and 1 is the unit digit of 81)
= 1 × 3
= 3 **...(A)**

unit digit of 659=6 **...(B)**(∵ unit digit is 6 for all powers of 6)

771=(74)17×73
Hence, unit digit of 771
= unit digit of (74)17 × unit digit of 73 **----(1)**

unit digit of (74)17
= unit digit of (7×7×7×7)17
= unit digit of (9×9)17(∵ 7×7=49 and 9 is the unit digit of 49)
= unit digit of 117(∵ 9×9=81 and 1 is the unit digit of 81)
= 1 **...(2)**

unit digit of 73
= unit digit of (7×7×7)
= unit digit of (9×7)(∵ 7 × 7 = 49 and 9 is the unit digit of 49)
= 3 **...(3)**(∵ 9 × 7 = 63 and 3 is the unit digit of 63)

Hence from (1),(2) and (3),
unit digit of 771=1×3=3 **----(C)**

We have already found out that
unit digit of 365=3 (from A)
unit digit of 659=6 (from B)

unit digit of 771=3 (from C)

Hence, unit digit in the number represented by 365×659×771
= unit digit of (3×6×3)
= unit digit of (8×3)

(∵ 3 × 6 = 18 and 8 is the unit digit of 18)
= 4 (∵ 8 × 3 = 24 and 4 is the unit digit of 24)

88. 112 × 112 + 88 × 88 = ?

A. 26218 B. 20328
C. 20288 D. 24288

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Notebook

answer with explanation

Answer: Option C

Explanation:

$(a+b)^2=a^2+2ab+b^2 (a-b)^2=a^2-2ab+b^2 (a+b)^2+(a-b)^2=2(a^2+b^2)$

(read more)

$112\times112+88\times88=112^2+88^2=(100+12)^2+(100-12)^2=2(100^2+12^2)=2(10000+144)=2\times10144=20288$

89. 9312×9999=?

A. 93110688 B. 93010688
C. 93110678 D. 83110688

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Notebook

answer with explanation

Answer: Option A

Explanation:

$9312\times9999=9312(10000-1)=93120000-9312=93110688$

90. 112×112−88×88=?

A. 4600 B. 4700

C. 4800 D. 4900

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answer with explanation

Answer: Option C

Explanation:

$a2-b2=(a-b)(a+b)$

(read more)

$112\times112-88\times88=1122-882=(112-88)(112+88)=24\times200=4800$

91. $1234+123+12-?=1221$

A. 148 B. 158

C. 168 D. 178

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answer with explanation

Answer: Option A

Explanation:

$?=1234+123+12-1221=148$

92. A three-digit number 4a3 is added to another three-digit number 984 to give a four digit number 13b7, which is divisible by 11. What is the value of (a + b)?

A. 9 B. 10

C. 11 D. 12

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answer with explanation

Answer: Option B

Explanation:

(Reference : Divisibility by 11 rule)

4 a 3

9 8 4

13 b 7
=> a + 8 = b ...(1)

13b7 is divisible by 11
=> (1 + b) - (3 + 7) is 0 or divisible by 11
=> (b - 9) is 0 or divisible by 11 ...(2)

Assume that (b - 9) = 0
=> b = 9

Substituting the value of b in (1),
a + 8 = b
a + 8 = 9
=> a = 9 - 8 = 1

If a = 1 and b= 9,
(a + b) = 1 + 9 = 10
10 is there in the given choices. Hence this is the answer.

93. 122×122+322×322
−2×122×322=?

A. 44000 B. 42000
C. 38000 D. 40000

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answer with explanation

Answer: Option D

Explanation:

(a−b)2=a2−2ab+b2

(read more)

122×122+322×322−2×122×322=1222−2×122×322+3222=(122−322)2=(−200)2=40000

94. 22+42+62+⋯+142=?

A. 559 B. 363
C. 364 D. 560
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answer with explanation

Answer: Option D

Explanation:

12+22+32+⋯+n2
=∑n2=n(n+1)(2n+1)6

(read more)

22+42+62+⋯+142

=(2×1)2+(2×2)2+(2×3)2 +⋯+(2×7)2

=(22×12)+(22×22)+(22×32) +⋯+(22×72)

=22(12+22+32+⋯+72) =22[n(n+1)(2n+1)6] =4[7(7+1)(2×7+1)6] =4×7×8×156 =4×7×8×52 =2×7×8×5 =56×10 =560

95. The sum of the two numbers is 11 and their product is 24. What is the sum of the reciprocals of these numbers ?
A. 712
B. 1112

C. 1124
D. 78

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answer with explanation

Answer: Option C

Explanation:

Let the numbers be x

and y Then
x+y=11xy=24

Hence,
x+yxy=1124
⇒1y+1x=1124

96. What is the difference between the place values of two sevens in the numeral 54709479 ?

A. 699930 B. 699990
C. 99990 D. None of these

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answer with explanation

Answer: Option A

Explanation:

Required Difference
= 700000 - 70 = 699930

97. Which of the following numbers completely divides (461+462+463+464)
?

A. 11 B. 10
C. 9 D. 7

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answer with explanation

Answer: Option B

Explanation:

461+462+463+464=461(1+41+42+43)=461(1+4+16+64)=461×85=461×5×17=460×4×5×17=460×20×17=460×10×2×17

Hence this is completely divisible by 10

98. A number when divided by 75 leaves 34 as remainder. What will be the remainder if the same number is divided by 65?

A. 3 B. 1
C. 6 D. 9

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answer with explanation

Answer: Option D

Explanation:

Let the number be x

Let $x \div 75 = p$ and remainder = 34

$\Rightarrow x=75p+34 \Rightarrow x=(25p\times3)+25+9 \Rightarrow x=25(3p+1)+9$

Hence, if the number is divided by 25, we will get 9 as remainder

99. The number 7490xy
is divisible by 90. Find out (x+y)
.

A. 4 B. 5
C. 6 D. 7

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answer with explanation

Answer: Option D

Explanation:

If a number is divisible by two co-prime numbers, then the number is divisible by their product also.(read more)

A number is divisible by 10 if the last digit is 0. (read more)

A number is divisible by 9 if the sum of its digits is divisible by 9.(read more)

$10\times9=90$ where 10 and 9 are co-prime numbers. Hence, if 7490xy

is divisible by 9 and 10, it will also be divisible by 90

Suppose 7490xy is divisible by 10. We know that a number is divisible by 10 if the last digit is 0. Hence y=0

Thus we have the number 7490x0. If this is divisible by 9,
7+4+9+0+x+0 is divisible by 9

=> 20+x is divisible by 9 (where x is a digit)
=> x=7

Hence, (x+y)=(7+0)=7

100. What is the smallest 3 digit prime number?

A. 107 B. 100

C. 102 D. 101

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answer with explanation

Answer: Option D

Explanation:

1. Prime Numbers
2. Divisibility Rules

102 is divisible by 2
=> 102 is not a prime number

100 is divisible by 2
=> 100 is not a prime number.

$\sqrt{101}<11$

101 is not divisible by the prime numbers 2, 3, 5, 7
Hence 101 is a prime number.

Since 100 is not a prime number, 101 is the smallest 3 digit prime number.

$\sqrt{107}<11$
107 is also not divisible by the prime numbers 2,3,5,7
Hence 107 is also a prime number.
But the smallest 3 digit prime number is 101