UNIT – 1 : HCF AND LCM

1) Greatest Common Divisor of two numbers is 8 while their Least Common Multiple is 144. Find the other number if one number is 16.
- Published on 03 May 17

a. 108

b. 96

c. 72

d. 36

Answer | Explanation

ANSWER: 72

Explanation:

Tip:
If A and B are two numbers,
A x B = HCF of A and B x LCM of A and B

$\therefore 16 \times ? = 8 \times 144$
$\therefore ? = 72$

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2) LCM of two numbers is 138. But their GCD is 23. The numbers are in a ratio 1:6. Which is the largest number amongst the two?
- Published on 03 May 17

a. 46

b. 138

c. 69

d. 23

Answer | Explanation

ANSWER: 138

Explanation:

Let the common factor be K

∴ The numbers are K and 6K

Tip:

If A and B are two numbers,

A x B = HCF of A and B x LCM of A and B

∴ K x 6K = 23 x 138

∴ $K^2 = 23 \times 23$

∴ **K = 23**

∴ **Larger number** = 6k = 6 x 23 = **138**

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3) The least common multiple of two numbers is 168 and highest common factor of them is 12. If the difference between the numbers is 60, what is the sum of the numbers?

a. 108

b. 96

c. 122

d. 144

Answer | Explanation

ANSWER: 108

Explanation:

Tip:
If A and B are two numbers,
A x B = HCF of A and B x LCM of A and B

$\therefore AB = 12 \times 168$
Also, A-B = 60
Now we know that,
$(A+B)^2 - (A-B)^2 = A^2+2AB+B^2 - (A^2-2AB+B^2) = 4AB$
$\therefore (A+B)^2 = 4 \times 12 \times 168 + 60^2$
$\therefore$ **$(A+B)^2 = 8064 + 3600 = 11664$**

Tip:
Since **11664 ends in 4, square root will have 2 or 8 in end.** So answer is **108 or 122.**
$120^2 = 120 \times 120 = 144 \times 100 = 14400$
$11664 < 14400 \quad \therefore 11664 < 122^2$
So, answer is 108

$\therefore$ **A+B = 108**

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4) If least common multiple of two numbers is 225 and the highest common factor is 5 then find the numbers when one of the numbers is 25?

a. 75

b. 65

c. 15

d. 45

Answer | Explanation

ANSWER: 45

Explanation:

Tip:
If A and B are two numbers,
A x B = HCF of A and B x LCM of A and B

$\therefore 25 \times ? = 5 \times 225$
$\therefore ? = 45$

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5) The greatest number of four digits which is divisible by 15, 25, 40, 75 is

a. 600

b. 9000

c. 9600

d. 9400

Answer | Explanation

ANSWER: 9600

Explanation:
We want 4 digit number, so option A is not the answer
Now we want greatest number. So out of remaining options, 9600 is greatest
9600 is divisible by 25, 75, 40 and 15
So answer is C i.e. 9600

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6) What is the least number which when divided by the numbers 3, 5, 6, 8, 10 and 12 leaves in each case a remainder 2 but which when divided by 13 leaves no remainder?

a. 312

b. 962

c. 1586

d. 1562

Answer | Explanation

ANSWER: 1586

Explanation:

Approach 1 – Direct Observation

The **number must be divisible by 13**.
Option a, b. d are divisible. C is not.
So C is not the answer
Now the number leaves remainder 2 when divided by 3, 5, 6, 8, 10, and 12.
So **'Number -2' should be divisible by 3, 5, 6, 8, 10, and 12**
Take Option A i.e. 312-2 = 310.
But 310 is **not divisible** by 3
Take Option D i.e. 1586-2 = 1584
We see that 1584 is not divisible by 10
So mark C as answer

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7) When a number is divided by 893 the remainder is 193. What will be the remainder when it is divided by 47?

a. 19

b. 5

c. 33

d. 23

Answer | Explanation

ANSWER: 5

Explanation:

In such cases and sums, simply follow these easy steps

Number is divided by 893. **Remainder = 193.**

Also, we observe that 893 is exactly divisible by 47.

So now simply divide the remainder by 47.

47	193	**4**
	-188	
	05	

So remainder is 5

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8) The sum of two numbers is 156 and their HCF is 13. The numbers of such number pairs is

a. 2

b. 5

c. 4

d. 3

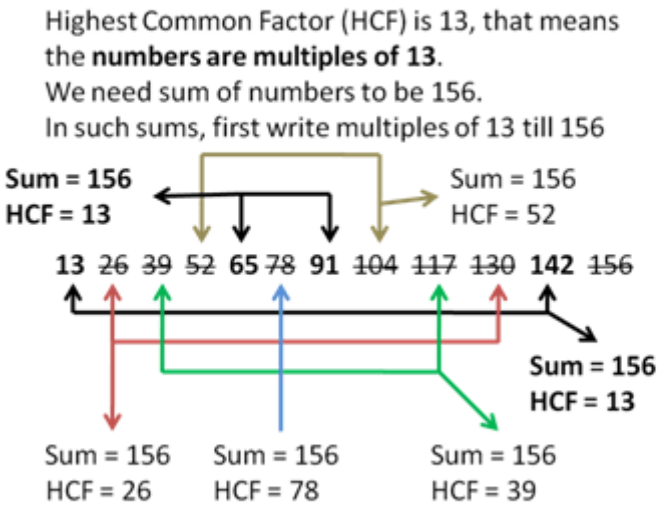
Answer Explanation

ANSWER: 2

Explanation:

The solution might look difficult but it very easy to understand and solve

Just observe the image carefully



Thus, there are **two such pairs, (13, 142) and (65,91)**

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9) The L.C.M. of two numbers is 14560 and their H.C.F. is 13. If one of them is 416, the other is

a. 460

b. 455

c. 450

d. 445

Answer | Explanation

ANSWER: 455

Explanation:

Tip:
If A and B are two numbers,
A x B = HCF of A and B x LCM of A and B

∴ 416 x Number = 14560 x 13
∴ **Number = 455**

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10) The greatest length of the scale that can measure exactly 30 cm, 90 cm, 1 m 20 cm and 1 m 35 cm lengths is

a. 5 cm

b. 10 cm

c. 15cm

d. 30 cm

Answer | Explanation

ANSWER: 15cm

Explanation:

Here we need to exactly measure these lengths.

Also, 1m = 100 cm; ∴ 1m 35cm = 135cm **and** 1m 20cm = 120cm

Option 1 – **5 cm can measure** 30cm, 90cm, 1m 20cm and 1m 35 cm

Option 2 – **10 cm cannot measure** 1m 35 cm i.e. 135cm

Option 3 –15 cm can measure 30cm, 90cm, 1m 20cm and 1m 35 cm

Option 4 –**30 cm cannot measure** 1m 35 cm

Since we want greatest length, 15 > 5

∴ **Answer = 15cm**

11) What will be least number of marbles with Rohit if he can arrange them in rows 15 marbles each as well as make a perfect solid square out of all the marbles?

a. 133
b. 43
c. 90

d. 900

Answer | Explanation

ANSWER: 900

Explanation:

We need the least number, which means we must first find LCM of 18, 10 and 15

3	18	10	15
2	6	10	5
5	3	5	5
	3	**1**	**1**

∴ **LCM** = 3 x 2 x 5 x 3 = **90**

90 is not a perfect square.

90 = 3 x 3 x 2 x 5

Here there are two 3's (this gives square of 3) but only one 2 and one 5

If we multiply by 2 and 5 then we get, 3 x 3 x 2 x 2 x 5 x 5 = **900**

900 is perfect square = number of marbles

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12) 3 birds fly along the circumference of a jungle. They complete one round in 27 minutes, 45 minutes and 63 minutes respectively. Since they start together, when will they meet again at the starting position?

a. 945 minutes

b. 126 minutes

c. 135 minutes

d. 9 hours

Answer | Explanation

ANSWER: 945 minutes

Explanation:

We need the next instance that means the LCM of times of all 3 birds.

9	27	45	63
	3	**5**	**7**

∴ **LCM** = 9 x 3 x 5 x 7 = **945** = **They meet after 945 minutes**

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13) What least possible 4-digit number, when divided by 12, 16, 18 and 20 leaves 21 as remainder?

a. 36

b. 133

c. 144

d. 1461

Answer | Explanation

ANSWER: 1461

Explanation:

Here least possible 4 digit number is needed that means we need the LCM
We must first find LCM of 12, 16, 18 and 20

2	12	16	18	20
3	6	8	9	10
2	2	8	3	10
	1	**4**	**3**	**5**

$\therefore$ **LCM** $= 2 \times 3 \times 2 \times 1 \times 4 \times 3 \times 5 =$ **720**
Now this is a 3 digit number.
If we multiply it by 2 we get $(720 \times 2) =$ **1440 → (4 digit number)**
But 1440 is divisible by 12, 16, 18 and 20
We must have 21 as remainder, as per given condition.
So, **Number = 1440 + 21 = 1461**

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14) 5 clocks ring automatically at intervals of 12 minutes, 8 minutes, 3 minutes, 4 minutes and 10 minutes, respectively. In 8 hours from the moment they start, how many times will they ring together?

a. 12 times

b. 5 times

c. 3 times

d. 4 times

Answer | Explanation

ANSWER: 4 times

Explanation:

We need the next instances when the alarm rings.

That means the Least Common Multiple (LCM) of 3, 4, 8, 10, 12

3, 4 divide 12 so neglect them.

LCM of 8, 10 and 12

4	8	10	12
2	2	10	3
	1	**5**	**3**

∴ **LCM** = 4 x 2 x 5 x 3 = **120** = **They ring after 2 hours**

After starting, they ring together 1st time in 2 hours.

Then 2nd time in 2+2 = 4 hours.

Then 3rd time in 6 hours.

And **4th time** in **8 hours**.

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15) What least number when divided by 36, 24 and 16 leaves 11 as remainder in each case?

a. 36

b. 133

c. 144

d. 155

Answer | Explanation

ANSWER: 155

Explanation:

Here least number is needed that means we need the LCM

We must first find LCM of 36, 24 and 16

4	16	24	36
3	4	6	9
2	4	2	3
	2	**1**	**3**

∴ **LCM** = 4 x 3 x 2 x 2 x 1 x 3 = **144**

Since **remainder is same just add** it to this LCM

Number = 144 + 11 = **155**

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16) If (x - 4) is the HCF of x^2 - 8x + 15 and x^2 - kx +1 , then what is k?

a. 8/15

b. 4

c. 5

d. 15/8

Answer | Explanation

ANSWER: 4

Explanation:

(x-4) is HCF i.e. a factor of both equations

∴ The equations must get satisfied for x=4

Also, when x=4, both equations are equal in value.

Putting x=4 in both equations

$4^2 - 8(4) + 15 = 4^2 - k(4) + 1$

∴ 31-32 = 17- 4k

∴ **k=4**

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17) What least number when divided by 20, 48 and 36 leaves the remainders 13, 41 and 29, respectively?

a. 720

b. 713

c. 727

d. 187

Answer | Explanation

ANSWER: 713

Explanation:

Here least number is needed that means we need the Least Common Multiple i.e. LCM

We must now first find LCM of 20, 36 and 48

4	20	36	48
3	5	9	12
	5	**3**	**4**

∴ **LCM** = 4 x 3 x 5 x 3 x 4 = **720**

But this is not the answer because there are remainders as per the given condition.

If we observe closely, the difference between the given numbers and remainders is same

20-13 = **7**; 48-1 = **7**; 36-29 = **7**

Difference is same = 7

So simply subtract this difference from LCM.

Number = 720 - 7 = 713

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18) There are 3 equilateral triangles with sides 114cm, 76cm and 152 cm. What maximum size scale can measure them exactly?

- Published on 27 Mar 17

a. 19 cm

b. 21 cm

c. 38 cm

d. None of the above

Answer | Explanation

ANSWER: 38 cm

Explanation:

Here the answer is HCF of 114, 76 and 152

2	76	114	152
19	38	57	76
	1	3	2

∴ HCF = 2 x 19 = 38 = Maximum scale size needed to measure all 3 exactly

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19) What greatest number divides 17, 42 and 93 and leaves remainders 4, 3 and 15, respectively?

- Published on 27 Mar 17

a. 89

b. 78

c. 13

d. 17

Answer | Explanation

ANSWER: 13

Explanation:

Here greatest number that can divide means the HCF

Remainders are different so simply subtract remainders from numbers

17-4 = **13**; 42-3 = **39**; 93-15 = **78**

Now let's find HCF of 13, 39 and 78

By direct observation we can see that all numbers are divisible by 13.

∴ HCF = 13 = required greatest number

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20) What largest number will divide 47, 35 and 27 leaving same remainder in each case? What will be the common remainder?

- Published on 07 Jul 17

a. 9, 1

b. 1, 9

c. 4, 3

d. 3, 4

Answer | Explanation

ANSWER: 4, 3

Explanation:

What to do when we don't know the remainder and the largest number which divides?

In such cases subtract the 3 numbers from each other

47-35 = 12

35-27 = 8

27-47 = -20 (Ignore minus sign)

Largest number is needed that means we need HCF of 12, 8 and 20

4	12	8	20
	3	2	5

Cannot divide further

∴ HCF = 4 = Largest number that can divide leaving common remainder

$\frac{47}{4} = 11\frac{3}{4}$

∴ Common remainder = 3

UNIT – 2 : PERCENTAGE

1) A's salary is 50% more than B's. How much percent is B's salary less than A's?

- Published on 11 Apr 17

a. 33(1/4)%

b. 33(1/3)%

c. 33(1/2)%

d. 33%

Answer | Explanation

ANSWER: 33(1/3)%

Explanation:

Let salary of B be Rs. 100

So salary of A = 150% of Rs. 100 = Rs. 150

Now, how much percent is B's salary less than A's?

$$\frac{A's\ salary - B's\ salary}{A's\ salary} \times 100 = \frac{50}{150} \times 100 = 33\frac{1}{3}\%$$

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2) The price of cooking oil has increased by 25%. By what percent should a family reduce the consumption of cooking oil so as not to increase the expenditure in this account?

- Published on 11 Apr 17

a. 20%

b. 25%

c. 18%

d. 16%

Answer | Explanation

ANSWER: 20%

Explanation:

Expenditure = Price x Consumption Quantity

New price (P2) is 25% more than original (P1) = **125% of P1**

Let consumption reduce to A% of initial consumption C

Since expenditure is same,

Initial Price x Consumption = Final Price x Consumption

P1 x C = P2 x A% of C

$\therefore P1 \times C = \frac{125}{100} P1 \times \frac{A}{100} C$

$\therefore A = 80\%$

$\therefore$ **Consumption should** become 80% i.e. **reduce by** (100-80=) **20%**

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3) Ramesh's salary was reduced by 10% and then the reduced salary was increased by 10%. What was his ultimate loss?

- Published on 11 Apr 17

a. 0%

b. 10%

c. 1%

d. 5%

Answer | Explanation

ANSWER: 1%

Explanation:

Let, initial salary be Rs. 100

Now salary was reduced by 10% so **salary becomes** (100-10=) **90% of 100**

$\therefore$ Salary = Rs. 90

Now salary was increased by 10% so **salary becomes** (100+10=) **110% of 90**

$\therefore$ **Salary = Rs. 99**

$\textbf{Loss \%} = \frac{\text{Loss}}{\text{Initial Salary}} \times 100 = \frac{1}{100} \times 100 = \textbf{1\%}$

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4) In a country 55% population is female. 80% of the male population is literate. How much of females are literate if total literacy is 58%?

- Published on 11 Apr 17

a. 45%

b. 55%

c. 40%

d. 22%

Answer | Explanation

ANSWER: 40%

Explanation:

In such cases it is very easy to solve by taking total population = 100

So, **Females** = 55% of 100 = **55** and **Males** = 100-55 = **45**

Now, **literate population** = 58% of 100 = **58 people**

Male literate population = 80% of 45 = **36**

Also, **Female literates + Male literates = Total literates**

∴ Female literates = 58-36 = 22 females are literates

Now how much percent is 22 of 55?

Female Literates in % $= \frac{22}{55} \times 100 =$ **40%**

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5) Two numbers are less than a third number by 30% and 37% respectively. How much percent is the second number less than the first?

- Published on 05 Apr 17

a. 7%

b. 10%

c. 4%

d. 3%

Answer | Explanation

ANSWER: 10%

Explanation:

Let the 3rd number be 100.

So, **1st number** is 30% less than 100 = (100-30)% of 100 = **70**

Also, **2nd number** is 37% less than 100 = (100-37)% of 100 = **63**

Now, how to find how much percent is 2nd number less than 1st?

% less $= \frac{70-63}{70} \times 100 = \frac{7}{70} \times 100 =$ **10%**

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6) 40% of greater number is equal to 60% of the smaller. If their sum is 150, then the greater number is

- Published on 05 Apr 17

a. 70

b. 80

c. 90

d. 60

Answer | Explanation

ANSWER: 90

Explanation:

Sum is 150 so 70 and 60 cannot be greater numbers as 150-70 = 80 which is greater than 70. Same for 150-60 = 90

So answer can be option b (80) or option c (90)

Consider 80 first. So smaller number will be (150-80=) 70

$40\% \text{ of } 80 = \frac{40}{100} \times 80 = 32$

$60\% \text{ of } 70 = \frac{60}{100} \times 70 = 42$

$32 \neq 42$ so **80 is not the answer**

So answer is Option C = 90

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7) If X% of Y is 100 and Y% of Z is 200, find a relation between X and Z.

- Published on 05 Apr 17

a. Z = X/2

b. Z = 2X

c. X = Z/4

d. Z = 4X

Answer | Explanation

ANSWER: Z = 2X

Explanation:

As per given conditions,

$\frac{X}{100} \times Y = 100 \quad \therefore Y = \frac{100 \times 100}{X}$

Also, $\frac{Y}{100} \times Z = 200$

$\therefore \frac{100 \times 100 \times Z}{X \times 100} = 200$

$\therefore Z = 2X$

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8) If 20% of an electricity bill is deducted, then Rs. 100 is still to be paid. How much was the original bill?

- Published on 05 Apr 17

a. Rs. 110

b. Rs. 115

c. Rs. 120

d. Rs. 125

Answer | Explanation

ANSWER: Rs. 125

Explanation:

After 20% bill has been deducted, we still have to pay Rs. 100

So remaining (100 – 20=) **80% bill = Rs. 100**

$\therefore \frac{80}{100} \times \text{Bill} = 100$

$\therefore$ **Bill = Rs. 125**

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9) 5% of 5% of Rs. 100 is

- Published on 05 Apr 17

a. Rs. 0.25

b. Rs. 0.50

c. Rs. 10

d. Rs. 25

Answer | Explanation

ANSWER: Rs. 0.25

Explanation:

5% of 5% of Rs. $100 = \frac{5}{100}\left(\frac{5}{100} \times 100\right) =$ **Rs. 0.25**

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10) A town has population of 50,000 in 1988. In one year i.e. by 1989 it increased by 25%. Next year i.e. in 1990, it decreased by 30%. The next year in 1991 there was an increase of 40%. What is the population at end of 1991?

- Published on 17 Mar 17

a. 60250

b. 62250

c. 66550

d. 61250

Answer | Explanation

ANSWER: 61250

Explanation:

Tip:

Remember this formula. It is similar to formula for **COMPOUND INTEREST.**

$$\text{Population after n years} = P\left(1 \pm \frac{R}{100}\right)^n$$

P = Present Population; R = Rate of increase or decrease; n = number of years;

'+' = during increase; '-' = during decrease

Using formula given above -

Rate 1 = R1 = 25% (increase);

Rate 2 = R2 = 30% (decrease);

Rate 3 = R3 = 40% (increase)

$$\text{Population after 3 years} = 50{,}000\left(1 + \frac{25}{100}\right)\left(1 - \frac{30}{100}\right)\left(1 + \frac{40}{100}\right)$$

$$= 50{,}000\left(\frac{125}{100}\right)\left(\frac{70}{100}\right)\left(\frac{140}{100}\right)$$

$$= \mathbf{61{,}250}$$

11) If the price of a sugar is raised by 25%, then by how much per cent should a person reduce his consumption of sugar, so that his expenditure remains same? - Published on 17 Mar 17

a. 25%

b. 50%

c. 20%

d. 12.5%

Answer | Explanation

ANSWER: 20%

Explanation:

Let us assume his consumption was 1 kg at a sugar price of Rs 100.

Current expense = 1 x 100 = Rs. 100

New price = 125% of Rs. 100 = Rs. 125

What would be new consumption 'C' for expenses to stay same?

C x 125 = 100

C= 0.8kg

So, new consumption is 80% of the old i.e. it is **20% less** than old consumption.

Tip:

For such questions –

Always assume the price of unit quantity (1 kg) as a whole, easy to solve number, preferably 100 (because that is how we talk about percentages – 100%, 85%....so on)

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12) The population of a city is 50,000 at present. It increases at the rate of 10% per annum. What was its population 4 years ago from present?
- Published on 15 Mar 17

a. 36, 561

b. 35, 450

c. 34,151

d. 33,333

Answer | Explanation

ANSWER: 34,151

Explanation:

Tip:

Population n years ago $= \frac{P}{(1 \pm \frac{R}{100})^n}$

Using formula given above -

Present population = 50,000

Rate of increase = 10%

Number of years= 4

Population 4 years ago $= \frac{50,000}{(1+\frac{10}{100})^4}$

= 34,150.67 so it is approximately **34,151**

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13) The price of milk was first increased by 10% and then decreased by 20%. What is the net percentage change in final price of milk?
- Published on 15 Mar 17

a. 12%

b. 15%

c. 10%

d. 7.5%

Answer | Explanation

ANSWER: 12%

Explanation:

Let original price be 100

Increase of 10% means now price = 100 + (10% of 100) = Rs. 110

Now decrease of 20% means new price = Rs. 110 – (20% of 110)

= 110-22 = Rs. 88

Difference in old and new price = 100-88 = 12 (as new price is

lower than old price)

12 is what percent of 100? It is 12%.

=> The new price is 12% lesser than the original price.

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14) The population of a city is 50,000 at present. It increases at the rate of 10% per annum. What will be its population 3 yr from now?
- Published on 15 Mar 17

a. 67,250

b. 65,550

c. 60,500

d. 66,550

Answer | Explanation

ANSWER: 66,550

Explanation:

Tip:

Remember this formula. It is similar to formula for **compound interest.**

Population after n years $= P(1 \pm \frac{R}{100})^n$

P= Population; R = Rate of increase or decrease; n= number of years;

'+' = during increase; '-'= during decrease

Using formula given above -

Population after 3 years $= 50{,}000(1 + \frac{10}{100})^3$

$= \frac{50{,}000 \times 11 \times 11 \times 11}{10 \times 10 \times 10} =$ **66,550**

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15) The price of apple is first increased by 10% and then decreased by 10%. What is the change in the price of apple?
- Published on 15 Mar 17

a. 1.11%

b. 3.5%

c. 5%

d. 1%

Answer | Explanation

ANSWER: 1%

Explanation:

Let original price be 100

Increase of 10% means the price now = 100 + (10% of 100)

= Rs. 110

Now decrease of 10% means price now = Rs. 110 − (10% of 110)

= 110-11 = Rs. 99

So change in price = 100-99 = Re. 1

1 is how much percent of 100? It is 1%

So change in price is 1%.

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16) In an election which contested was contested by 2 candidates, one candidate got 40% of total votes and yet lost by 1000 votes. What is the total number of votes casted in the election?
- Published on 15 Mar 17

a. 10000

b. 6000

c. 8000

d. 5000

Answer | Explanation

ANSWER: 5000

Explanation:

Total votes = a

This means that, Votes of candidate 1 + Votes of candidate 2 = a

We know that, Votes of candidate 1 = 40% of a = $\frac{40a}{100}$

Hence, Votes of candidate 2 = (100%-40%) of a = 60% of a = $\frac{60a}{100}$

1st candidate lost by 1000 votes = difference of votes between both candidates

$\therefore \frac{60a}{100} - \frac{40a}{100} = 1000$

$\therefore a = 5000$

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17) If price of milk is 15% more than that of water, then price of water is how much per cent less than that of milk?
- Published on 15 Mar 17

a. 5%

b. 7.50%

c. 13.05%

d. 10.50%

Answer | Explanation

ANSWER: 13.05%

Explanation:

Suppose, 1litre water = Rs. 100

So, 1litre milk will be Rs. 100 + (15% of 100) = 100+15 = Rs. 115

Now, how would we express water as a percentage of milk?

$\frac{100}{115}$ x 100 = 86.95%

So, water is **86.95%** of milk => It is (86.95-100)

= 13.05% less than that of milk.

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18) By 20% decrease in the price of rice, people can buy 10 kg more rice in Rs.100. What is the original price of 1kg of rice?
- Published on 10 Mar 17

a. Rs. 1.5

b. Rs. 2.5

c. Rs. 5

d. Rs. 4.5

Answer | Explanation

ANSWER: Rs. 2.5

Explanation:

20% decrease in price means new price = 0.8P

Let us assume that people buy A kg rice in Rs. 100.

With 20% decrease in price, people will buy (A+10) kg rice in Rs. 100.

Expense = Rs. 100 = Price of rice x Quantity of rice

Since, **expense is same, we can say that**

A x P = (A+10) x 0.8P

$\therefore A = 0.8A + 8$ (Cancelling 'P' on both sides)

$\therefore A = 40$

$$\text{Price of rice} = \frac{100}{40} = \text{Rs. } 2.5 \text{ per kg.}$$

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19) If price of rice is 30% less than that of wheat, then price of wheat is how much per cent more than that of rice?
- Published on 10 Mar 17

a. 45%

b. 37.5%

c. 40.65%

d. 42.85%

Answer | Explanation

ANSWER: 42.85%

Explanation:

Suppose, 1 Kg Wheat = Rs. 100

So, 1 Kg Rice will be Rs. 100 – (30% of 100) = 100-30 = Rs. 70

Now, how would we express wheat as a percentage of Rice?

$\frac{100}{70}$ X 100 = 142.85%

So, wheat is **142.85%** of Rice => It is (142.85-100)

= 42.85% more than that of Rice.

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20) In a class, 15% of total number of students failed in Science, 25% of total number of students failed in Maths and 10% of total number of students failed in both. How much percentage of students passed in both Maths and Science?
- Published on 07 Jul 17

a. 70%

b. 80%

c. 60%

d. 90%

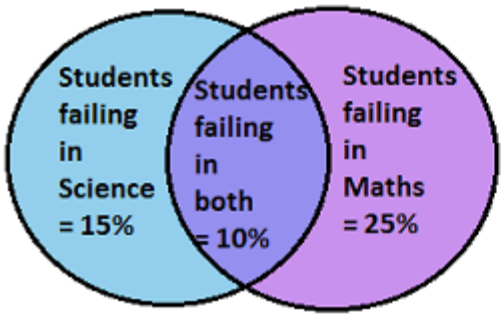
Answer | Explanation

ANSWER: 70%

Explanation:

Usual Mistake: Percentage of Students failing in both subjects = 25% + 15% = 40%

But as shown in the below diagram, the students who failed both subjects (10%) are counted twice - Once in 15% (blue circle) and once again in 25% (orange circle).



We need to subtract this double counting.

So students who failed subjects would be = 25% + 15% -10% = 30%

Remember:

Subtract only once and not twice!

Percentage of students who passed in both subjects = (100 – 30) % = 70%

Thus, 70% passed in both subjects.

UNIT – 3 : MEAN , MEDIAN AND MODE

In worksheet on mean median and mode the questions are based on finding the mean median and mode.

1. Find the mean of the following data.

(a) 9, 7, 11, 13, 2, 4, 5, 5

(b) 16, 18, 19, 21, 23, 23, 27, 29, 29, 35

(c) 2.2, 10.2, 14.7, 5.9, 4.9, 11.1, 10.5 (d) $1^1/_4$, $2^1/_2$, $5^1/_2$, $3^1/_4$, $2^1/_2$

2. Find the mean of first ten whole numbers.

3. Find the mean of first 5 prime numbers.

4. The mean of 8, 11, 6, 14, x and 13 is 66. Find the value of the observation x.

5. The mean of 6, 8, x + 2, 10, 2x - 1, and 2 is 9. Find the value of x and also the value of the observation in the data.

6. Find the mean of the following distribution.

(a) The age of 20 boys in a locality is given below.

Age in Years	12	10	15	14	8
Number of Boys	5	3	2	6	4

(b) Marks obtained by 40 students in an exam are given below.

Marks	25	30	15	20	24
Number of Students	8	12	10	6	4

(c)

x_i	1	2	3	4	5

f_i	4	5	8	10	3

(d) The daily wages of 50 employees in an organization are given below:

Daily wages (in $)	100 - 150	150 - 200	200 - 250	250 - 300
Number of Workers	12	13	17	8

Find the mean daily wages.

7. Find the mode of the following data.

(a) 12, 8, 4, 8, 1, 8, 9, 11, 9, 10, 12, 8

(b) 15, 22, 17, 19, 22, 17, 29, 24, 17, 15

(c) 0, 3, 2, 1, 3, 5, 4, 3, 42, 1, 2, 0

(d) 1, 7, 2, 4, 5, 9, 8, 3

8. The runs scored in a cricket match by 11 players is as follows:

7, 16, 121, 51, 101, 81, 1, 16, 9, 11, 16

Find the mean, mode, median of this data.

9. The weights in kg of 10 students are given below:

39, 43, 36, 38, 46, 51, 33, 44, 44, 43

Find the mode of this data. Is there more than 1 mode? If yes, why?

10. The marks obtained by 40 students out of 50 in a class are given below in the table.

Marks (in $)	42	36	30	45	50
Number of Students	7	10	13	8	2

Find the mode of the above data.

11. The number of rupee notes of different denominations are given below in the table.

Denominations (Rs)	10	20	5	50	100
Number of Notes	40	30	10	25	20

Find the mode of the above data.

12. Find the median of the following data.

(a) 27, 39, 49, 20, 21, 28, 38

(b) 10, 19, 54, 80, 15, 16

(c) 47, 41, 52, 43, 56, 35, 49, 55, 42

(d) 12, 17, 3, 14, 5, 8, 7, 15

13. The following observations are arranged in ascending order. The median of the data is 25 find the value of x.

17, x, 24, x + 7, 35, 36, 46

14. The mean of the following distribution is 26. Find the value of p and also the value of the observation.

x_i	0	1	2	3	4	5
f_i	3	3	p	7	p - 1	4

Also, find the mode and the given data.

Answers for the worksheet on mean median and mode are given below to check the exact answers of the above questions.

Answers:

1. (a) 7

(b) 24

(c) 8.5

(d) 3

2. 4.5

3. 5.6

4. 344

5. 9, 11, 17

6. (a) 11.8

(b) 23.15

(c) 3.1

(d) $196

7. (a) 8

(b) 17

(c) 3

(d) no mode

8. Mean = 39 1/11;

Mode = 16;

Median = 16

9. 43, 44

10. 30

11. 10

12. (a) 28

(b) 17.5

(c) 47

(d) 10

13. 18

14. 2, 1

UNIT – 4 : PROFIT AND LOSS

1) A person sold a stove for Rs. 423 and incurred a loss of 6%. At what price would it be sold so as to earn a profit of 8%?
- Published on 11 Apr 17

a. Rs. 525

b. Rs. 500

c. Rs. 490

d. Rs. 486

Answer | Explanation

ANSWER: Rs. 486

Explanation:

Tip:
If **loss is A%,** then **Selling Price = (100 - A)% of cost price**

$$\text{Selling Price} = \text{Rs. } 423 = (100\text{-}6)\% \text{ of CP} = \frac{94\,CP}{100}$$

$$\therefore \textbf{CP} = \textbf{Rs. } \frac{423 \times 100}{94}$$

Now profit should be 8%

Tip:
If **gain is A%,** then **Selling Price = (100+A)% of cost price**

$$\textbf{Selling Price} = (100+8)\% \text{ of Rs. } \frac{423 \times 100}{94} = \frac{108}{100} \times \frac{423 \times 100}{94}$$

$$\therefore \textbf{SP} = 54 \times \frac{423}{47} = 54 \times 9 = \textbf{Rs. 486}$$

2) A fruit seller buys lemons at 2 for a rupee and sells then at 5 for three rupees. His gain percent is

- Published on 11 Apr 17

a. 10%

b. 15%

c. 20%

d. 25%

Answer | Explanation

ANSWER: 20%

Explanation:

Seller buys 2 lemons for one rupee.

So how much can he buy in say **Rs. 10**

He will get $2 \times 10 = 20$ lemons in **Rs. 10 = Cost price**

He sells 5 lemons for Rs. 3.

So for 20 lemons he will get **Rs. ?**

$$\therefore ? = \frac{20 \times 5}{3} = \textbf{Rs. 12} = \textbf{Selling Price}$$

Gain= SP-CP = 12-10 = Rs. 2

$$\textbf{Gain percent} = \frac{\text{Gain}}{\text{Cost price}} \times 100 = \frac{2}{10} \times 100 = \textbf{20\%}$$

---

3) A sells a car to B at 10% loss. If B sells it for Rs. 54000 and gains 20%, the cost price of the car for A was

- Published on 11 Apr 17

a. Rs. 25000

b. Rs. 50000

c. Rs. 37500

d. Rs. 60000

Answer | Explanation

ANSWER: Rs. 50000

Explanation:

B sells for profit of 20%

> **Tip:**
> If **gain is A%,** then **Selling Price = (100+A)% of cost price**

Selling Price = Rs. 54000 = (100+20)% of CP = $\frac{120}{100}$ x CP

∴ CP for B = 54000 x $\frac{100}{120}$ = 54 x 9 = **Rs. 45000 = SP for A**

For A there was loss of 10%

> **Tip:**
> If **loss is A%,** then **Selling Price = (100 - A)% of cost price**

Selling Price for A = Rs. 45000 = (100-10)% of CP = $\frac{90CP}{100}$

∴ CP = Rs. $\frac{\mathbf{45000 \times 100}}{\mathbf{90}}$ **= Rs. 50000**

---

4) Ramesh sold a statue for a price 25% higher than the original price of the statue. He had however bought the statue at 20% discount on the original price. With the profit of Rs. 2025, find the original price of the statue.

a. Rs. 6000

b. Rs. 7500

c. Rs. 3500

d. Rs. 4500

Answer | Explanation

ANSWER: Rs. 4500

Explanation:

Let original price be P.

Selling Price = 25% more than original price = **125% of P**

Discount is 20%, so, Cost price = (100-20=) **80% of P**

Profit = Selling Price – Cost price

$$2025 = 125\% \text{ of } P - 80\% \text{ of } P = 45\% \text{ of } P = \frac{45}{100} \times P$$

$$\therefore \mathbf{P} = \frac{2025 \times 100}{45} = \mathbf{Rs.\ 4500 = Original\ price}$$

---

5) If selling price of 40 articles is equal to cost price of 50 articles, the loss or gain percent is

a. 25% loss

b. 20% loss

c. 25% gain

d. 20% gain

Answer | Explanation

ANSWER: 25% gain

Explanation:

Let cost price of 1 article be Re.1

So total **Cost price** = 50 x Re. 1 = **Rs. 50**

Selling prices of 40 articles = Cost price of 50 articles = Rs. 50

$\therefore$ Selling prices of 50 articles = **Rs. ?**

$$\therefore ? = \frac{50 \times 50}{40} = \mathbf{Rs.\ 62.5 = Selling\ Price\ of\ 50\ articles}$$

SP > CP so gain

$$\mathbf{Gain\%} = \frac{\mathbf{SP - CP}}{\mathbf{CP}} \mathbf{\times 100} = \frac{12.5}{50} \times 100 = \mathbf{25\% = Gain}$$

---

6) Two bicycles were sold for Rs. 3990 each, gaining 5% on one and losing 5% on the other. The gain or loss percent on the whole transaction is

a. Neither gain nor loss

b. 2.5% gain

c. 2.5% loss

d. 0.25% loss

Answer | Explanation

ANSWER: 0.25% loss

Explanation:

Tip:
Whenever a person has **A% loss for one** thing and **A% profit for second** thing, then if selling price is same, person will **ALWAYS HAVE LOSS**
And **Loss** $= \frac{A^2}{100}\%$

$$\textbf{Loss} = \frac{5^2}{100}\% = \textbf{0.25\%}$$

---

7) The ratio of cost price and selling price is 4:5. The profit percent is

a. 10%

b. 20%

c. 25%

d. 30%

Answer | Explanation

ANSWER: 25%

Explanation:

Cost Price (CP) : Selling Price (SP) = 4 : 5
Let, SP = Rs. 5 ; So, CP = Rs. 4
Profit = SP-CP = 5-4 = Re. 1

$$\textbf{Profit \%} = \frac{\textbf{Profit}}{\textbf{CP}} \textbf{ x 100} = \frac{1}{4} \text{ x } 100 = \textbf{25\%}$$

8) If a person sells a 'sari' for Rs. 5200, making a profit of 30%, then the cost price of the sari is

a. Rs. 4420

b. Rs. 4000

c. Rs. 3900

d. Rs. 3800

Answer | Explanation

ANSWER: Rs. 4000

Explanation:

Tip:
If **profit is A%,** then **Selling Price = (100+A)% of cost price**

Selling Price = (100+30)% of CP

$\therefore 5200 = \frac{130}{100} \times CP$

$\therefore$ **CP = Rs. 4000**

---

9) A shopkeeper earns a profit of 15% after selling a book at 20% discount on the printed price. The ratio of the cost price and printed price of the book is?

a. 20:23

b. 23:20

c. 16:23

d. 23:16

Answer | Explanation

ANSWER: 16:23

Explanation:

Approach 1 – Direct Observation

Profit and Discount is there,

So, **Cost Price (CP)< Selling Price (SP)<Printed Price (PP)**

This is true for ratio also. So, 23:20 and 23:16 is not possible as here CP > PP

Now first take 20:23

Let PP be 23.

20% discount means 20% of 23 = 4.6

SP = 23-4.6 = 18.4 ∴ SP<CP

Since profit is there SP should be > CP

So answer is 16:23

Approach 2 – By solving

Let the Printed Price be Rs. 100

Discount is 20%, So, Selling Price (SP) = (100-20)% of 100 = Rs. 80

Profit = Selling Price – Cost price = SP-CP = 80-CP

$$\text{Profit\%} = \frac{\text{Profit}}{\text{CP}} \times 100$$

$$\therefore 15 = \frac{80-\text{CP}}{\text{CP}} \times 100$$

$$\therefore 115\text{CP} = 8000$$

$$\therefore \text{CP} = \frac{1600}{23}$$

$$\therefore \frac{\text{CP}}{\text{Printed Price}} = \frac{\frac{1600}{23}}{100} = \frac{16}{23}$$

---

10) Simran bought pet food worth Rs. 56000. She then sold 1/3rd of it incurring a loss of 40%. What profit she must earn on rest of the supplies to nullify this loss? - Published on 27 Mar 17

a. 25%

b. 20%

c. 45%

d. 50%

Answer | Explanation

ANSWER: 20%

Explanation:

Nullify the loss means at the end there is no profit no loss.

To nullify loss of 40% in 1 part, we need profit of 40% from 2 parts

There are 3 parts –

1	2	3
Loss 40%	**Profit 40%**	**Profit 40%**

But this will give 40% + 40% = 80% profit.

We only need 40%

Since there are 2 parts, simply divide the required profit % by 2

$$\therefore \text{Required Profit \%} = \frac{40}{2} = 20\ \%$$

11) Ramesh gets a profit of 20% in one trade and suffers a loss of 20% in the second when he sells 2 cycles for Rs. 4000 each. What is his profit or loss in the entire trade?

- Published on 27 Mar 17

a. Loss = 4%

b. Loss = 16%

c. Profit = 16%

d. Profit = 4%

Answer | Explanation

ANSWER: Loss = 4%

Explanation:

Tip:

Whenever a person has **A% loss for one** thing and **A% profit for second** thing, then if selling price is same, person will **ALWAYS HAVE LOSS**

And **Loss** $= \frac{A^2}{100}$ **%**

Loss $= \frac{20^2}{100}\% =$ **4%**

---

12) Suman buys 160 chocolates for Rs. 480. She wanted to earn 30% profit by selling them. But Rakesh visited her and she gave him 25% of those chocolates at the cost price itself. But even after doing this, she earned a profit of 30% as decided. For how much did she sell each chocolate?

a. Rs. 3.8

b. Rs. 4.2

c. Rs. 6

d. Rs. 3

Answer | Explanation

ANSWER: Rs. 4.2

Explanation:

CP of 1 chocolate = 480 / 160 = Rs. 3

She wanted 30% profit on 160 chocolate. This means

Total Profit = 30% of (480) = Rs. 144

Now on giving 25% means 1/4th chocolates at CP, she has 160-40 = **120 chocolates** with her for earning **profit of Rs. 144**.

SP-CP = Profit on 1 chocolate

∴ 120 x (P-CP) = Total Profit

∴ 120(P-3) = 144

∴ P = Rs. 4.2 = cost of each chocolate

13) Guddi buys some oranges in a shop at 4 per rupee. She goes to other shop and buys same number of oranges at 5 per rupee. She then combines them in a basket and sells them at 4 per rupee. Will she get a profit or loss? And how much?

a. Profit = 100/9 %

b. Loss = 100/9 %

c. Profit = 116/9 %

d. Loss = 116/9 %

Answer | Explanation

ANSWER: Profit = 100/9 %

Explanation:

1 orange CP in 1st shop $= \text{Rs.}\ \frac{1}{4}$ and 1 orange CP in 2nd shop $= \text{Rs.}\ \frac{1}{5}$

On mixing these 2 oranges, the cost price of these 2 will be $= \frac{1}{4} + \frac{1}{5} = \text{Rs.}\ \frac{9}{20}$

So, CP of 1 orange $= \frac{\frac{9}{20}}{2} = \text{Rs.}\ \frac{9}{40}$

Actual price at which 1 orange is sold after combining $= \text{Rs.}\ \frac{1}{4}$

SP-CP $= \frac{1}{4} - \frac{9}{40} = \frac{1}{40} =$ **It is positive so it is profit**

Tip:

$$\textbf{\% Profit or Loss} = \frac{\textbf{Profit or Loss}}{\textbf{Cost Price}} \textbf{ x 100}$$

$$\textbf{\% profit} = \frac{1/40}{9/40} \text{ x } 100 = \frac{100}{9}\ \% = 11\frac{1}{9}\%$$

14) Chaman sells 40 fans at 10% profit. He wants a total of 20% profit on the entire sale. Since he got 160 fans at rate of Rs. 100 each, at what profit must he sell the

remaining fans?
- Published on 27 Mar 17

a. 70/3%

b. 160/58%

c. 30%

d. 100/3%

Answer | Explanation

ANSWER: 70/3%

Explanation:

Let Chaman need A% profit to make it overall 20% profit

$\therefore$ Profit on 160 fans = Profit on 40 fans + Profit on 120 fans

$\therefore$ 20% of (160 x 100) = 10% of (40 x 100) + A% of (120 x 100)

$\therefore 3200 = 400 + 120A$

$\therefore \mathbf{A = \frac{70}{3}\ \% = This\ much\ should\ be\ the\ percentage\ profit\ for\ rest\ fans}$

---

15) Uma wants to gain 15% profit on her sale of sugar. She buys 120 kg of sugar at Rs. 24 per kg to mix with 180 kg of sugar bought at Rs. 28 per kg. She sells the sugar mix at ….
- Published on 27 Mar 17

a. Rs. 8159

b. Rs. 9108

c. Rs. 9756

d. Rs. 8564

Answer | Explanation

ANSWER: Rs. 9108

Explanation:

Tip:

If **gain is A%,** then **Selling Price = (100+A) % of cost price**

Total cost of sugar = 120 x 24 + 180 x 28 = Rs. 7920

Selling Price = (100+15) % of 7920= $\frac{115}{100}$ x 7920= **Rs. 9108**

---

16) Rohit got profit of 11½% by selling his old car. However he realized that had he sold it for Rs. 8100 more, his profit would be 38.5%. At what price did he buy the car?

- Published on 07 Jul 17

a. Rs. 44500

b. Rs. 55000

c. Rs. 41000

d. Rs. 30000

Answer | Explanation

ANSWER: Rs. 30000

Explanation:

1st profit = 11.5 %

If Rohit sells for Rs. 6500 more, then profit = 38.5%

SP = (100 + Profit %) % of CP

$\therefore SP_1 + 81000 = SP_2$

$\therefore$ (111.5) % CP + 8100 = (138.5) % CP

$\therefore$ **27% of CP** = 8100

$\therefore CP = \frac{8100 \times 100}{27}$ = **Rs. 30000**

---

17) Rambabu sells paper planes at the rate of 20 planes for Re. 1. If he gets profit of 20%, how many planes did he buy in 1 rupee?

- Published on 07 Jul 17

a. 16

b. 40

c. 24

d. 36

Answer | Explanation

ANSWER: 24

Explanation:

Tip:

If **gain is A%,** then **Selling Price = (100+A) % of cost price**

Selling Price = Re. 1 = (120) % of CP = $\frac{120}{100}$ x CP

$\therefore$ CP = $\frac{1 \times 100}{120}$ = Rs. $\frac{5}{6}$

If 20 planes are bought in Rs. $\frac{5}{6}$

? planes are bought in Re. 1

? = $\frac{20 \times 6}{5}$ = 24 planes can be bought in 1 Re.

---

18) A cheater manipulated his weighing machine so that it shows 1kg for 970 grams. How much profit does he get?
- Published on 27 Mar 17

a. 397/100%

b. 0.3 %

c. 0.03%

d. 300/97%

Answer | Explanation

ANSWER: 300/97%

Explanation:

1kg is shown as 970 gm. So 30gm are less.

$$\textbf{Profit \%} = \frac{\text{Profit}}{\text{Cost Price i.e. Actual value}} \times 100 = \frac{30}{970} \times 100 = 3\frac{9}{97}\ \%$$

---

19) Ajay incurred loss of 20% by selling a vase for Rs. 2880. To get a profit of 20% at what price should he sell the vase?

- Published on 27 Mar 17

a. Rs. 4320

b. Rs. 5760

c. Rs. 1440

d. Rs. 3500

Answer | Explanation

ANSWER: Rs. 4320

Explanation:

Tip:

If **loss is A%,** then **Selling Price = (100 - A)% of cost price**

$$\textbf{Selling Price} = 2880 = (100\text{-}20)\ \%\ \text{of CP} = \frac{80\text{CP}}{100}$$

$$\therefore \text{CP} = \frac{2880 \times 100}{80}$$

$$\text{For profit} = 20\%, \textbf{Selling Price} = (100+20)\ \%\ \text{of CP} = \frac{120}{100} \times \frac{2880 \times 100}{80}$$

$$\therefore \textbf{Selling Price} = \textbf{Rs. 4320}$$

---

20) A sold a car to B at a profit of 25%. B incurred loss of 15% while selling the same car to C. A spent Rs. 50000 for this car. At what price did C buy it?
- Published on 07 Jul 17

a. Rs. 62500

b. Rs. 60000

c. Rs. 53125

d. Rs. 90000

Answer | Explanation

ANSWER: Rs. 53125

Explanation:

Tip:

If **gain is A%,** then **Selling Price = (100+A)% of cost price**

CP for B = SP for A = (100+25)% of 50000 = $\frac{125}{100}$ x 50000 = **Rs. 62500**

CP for C = SP for B = (100-15)% of 62500= $\frac{85}{100}$ x 62500= **Rs. 53125**

UNIT – 5 : SIMPLE AND COMPOUND INTEREST

SIMPLE INTEREST

1) Sam borrowed some money from his friend at simple interest of 6% per annum. He returned his friend Rs. 15600. After how much time did Sam return the money if he borrowed Rs. 12000?

- Published on 03 May 17

a. 8 years
b. 2.5 years
c. 5 years
d. 3.5 years

Answer | Explanation

ANSWER: 5 years

Explanation:

$\text{Amount} = \text{Principle} + \text{Simple Interest}$

$\therefore \textbf{Simple Interest} = 15600 - 12000 = \textbf{Rs. 3600}$

$$\textbf{Simple Interest} = \frac{\textbf{PRT}}{\textbf{100}}$$

Where P = Principal, R = Rate of interest and T = time period

$$\therefore 3600 = \frac{12000 \times 6 \times T}{100}$$

$\therefore \mathbf{T = 5\ years}$

---

2) Kabir paid Rs. 9600 as interest on a loan he took 5 years ago at 16% rate of simple interest. What was the amount he took as loan?

- Published on 03 May 17

a. Rs. 16400
b. Rs. 12000
c. Rs. 12500
d. Rs. 18000

Answer | Explanation

ANSWER: Rs. 12000

Explanation:

$$\text{Simple Interest} = \frac{PRT}{100}$$

Where P = Principal

R = Rate of interest

T = time period

$$\therefore 9600 = \frac{P \times 16 \times 5}{100}$$

$$\therefore \mathbf{P = Rs.\ 12000}$$

Suresh for 2 years invested Rs. 500 in SBI. He also invested Rs. 300 in ICICI for 4 years. At the end he received Rs. 220 from both banks as simple interest. What must have been rate of interest?

- Published on 03 May 17

a. 10%

b. 12%

c. 11%

d. 5.5%

Answer | Explanation

ANSWER: 10%

Explanation:

$$\text{Simple Interest} = SI = \frac{PRT}{100}$$

Where P = Principal, R = Rate of interest and T = time period

Total SI = SI from SBI and SI from ICICI

$$\therefore 220 = \frac{500 \times R \times 2}{100} + \frac{300 \times R \times 4}{100}$$

$$\therefore 220 = 10R + 12R$$

$$\therefore \mathbf{R = 10\% = Rate\ of\ Interest}$$

---

4) Raman paid Rs. 11400 as interest after 9 years. He had borrowed some money at rate of 6% for first two years, 9% for next three years and 14% for rest of the period. How much money did he borrow?

- Published on 13 Apr 17

a. Rs. 10000

b. Rs. 15000

c. Rs. 12000

d. Rs. 12500

Answer | Explanation

ANSWER: Rs. 12000

Explanation:

Here, Principal amount is same but rate of interest is different for different time periods.

So **simple interest would also be different**

$$\text{Simple Interest} = \frac{PRT}{100}$$

Where P = Principal, R = Rate of interest and T = time period

Time periods are 2 years, 3 years and (9-2-3=) 4 years

$$\therefore 11400 = \frac{P \times 6 \times 2}{100} + \frac{P \times 9 \times 3}{100} + \frac{P \times 14 \times 4}{100}$$

$$\therefore \mathbf{P = Rs.\ 12000}$$

---

5) Ram gets Rs. 2600 for Rs. 2000 in 5 years at some rate of simple interest. Had he invested in other places where rate of simple interest is 3% more than current rate, how much would have Ram got in same time?

- Published on 13 Apr 17

a. Rs. 2900

b. Rs. 3000

c. Rs. 3100

d. Rs. 2800

Answer | Explanation

ANSWER: Rs. 2900

Explanation:

Amount = Principal + Simple Interest

$\therefore$ **Simple Interest in first case = 2600-2000 = Rs. 600**

$$\text{Also, Simple Interest} = \frac{PRT}{100}$$

Where P = Principal, R = Rate of interest and T = time period

$$\therefore 600 = \frac{2000 \times R \times 5}{100}$$

$$\therefore \mathbf{R = 6\%}$$

Now in second case, R = 6+3 = 9%

Amount = Principal + Simple Interest

$$\therefore \textbf{Amount} = 2000 + \frac{2000 \times 9 \times 5}{100} = \textbf{Rs. 2900}$$

6) Guddi invested some money in a bank at rate of 6% per annum. At simple interest, after 9 years, she got Rs. 8470. How much did she invest?

- Published on 11 Apr 17

a. Rs. 5250

b. Rs. 6550

c. Rs. 6400

d. Rs. 5500

Answer | Explanation

ANSWER: Rs. 5500

Explanation:

$$\text{Amount} = \text{Principal} + \text{Simple Interest}$$

$$\text{Simple Interest} = \text{SI} = \frac{\text{PRT}}{100}$$

$$\text{Where P} = \text{Principal, R} = \text{Rate of interest and T} = \text{time period}$$

$$\therefore 8470 = \text{P} + \frac{\text{P x 6 x 9}}{100}$$

$$\therefore 8470 \text{ x } 100 = 154\text{P}$$

$$\therefore \textbf{P} = \textbf{Rs. 5500} = \textbf{Amount invested by Guddi}$$

---

7) Aman got a salary of Rs. 8600. The salary was invested by him in two parts. Find the difference between the two parts of his salary, if in first part he got some simple interest at 15% per annum in 4 years, which was same as the second part which he invested at 20% for 3 years.

- Published on 11 Apr 17

a. Rs. 0

b. Rs. 2400

c. Rs. 100

d. Rs. 4500

Answer | Explanation

ANSWER: Rs. 0

Explanation:

Let, **one part of salary be Rs. M**, then **other part is Rs. (8600-M)**

We know that **simple interest is same**

$$\text{Simple Interest} = SI = \frac{PRT}{100}$$

Where P = Principal, R = Rate of interest and T = time period

$$\therefore \frac{M \times 15 \times 4}{100} = \frac{(8600-M) \times 20 \times 3}{100}$$

$\therefore$ M = Rs. 4300 = One part of salary

Second part = 8600-4300 = Rs. 4300

Difference between parts = 4300-4300 = **Rs.0**

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8) Aman invests Rs. 8000 at some rate of interest. Being simple interest the money doubles in 5 years. Raj sees this and invests Rs. 6250 for 3 years at same rate of interest. How much interest does Raj get?

- Published on 11 Apr 17

a. Rs. 3750

b. Rs. 6250

c. Rs. 3125

d. Rs. 4250

Answer | Explanation

ANSWER: Rs. 3750

Explanation:

The money doubles, $\therefore$ Simple interest after 5 years = Principle = Rs. 8000

$$\text{Simple Interest} = SI = \frac{PRT}{100}$$

Where P = Principal, R = Rate of interest and T = time period

$$\therefore 8000 = \frac{8000 \times R \times 5}{100}$$

$\therefore$ R = 20%

Now, Raj will get,

$$\mathbf{SI} = \frac{6250 \times 20 \times 3}{100} = \mathbf{Rs.\ 3750}$$

---

9) If simple interest for 2 years for a sum is Rs. 600 and compound interest for the same sum for 2 years and same rate of interest is Rs. 645, what will be the rate of interest?

- Published on 11 Apr 17

a. 10%

b. 15%

c. 30%

d. 5%

Answer | Explanation

ANSWER: 15%

Explanation:

Simple interest for 2 years = Rs. 600

So 1st year Simple interest = Rs. 300

And 2nd year simple interest = Rs. 300

In compound interest, interest is given on the sum as well as the previous interest

Compound interest is Rs. 45 (Rs.645 - Rs.600) more than simple interest for 2 years

This means the extra Rs. 45 is simple interest given on the 2nd year simple interest

i.e. Rs. 300

$$\text{Simple Interest} = \frac{PRT}{100}$$

Where P = Principal, R = Rate of interest and T = time period

$$\therefore 45 = \frac{300 \times R \times 1}{100}$$

$$\therefore \mathbf{R = 15\%}$$

---

10) In 4 years the simple interest on certain sum of money is 9/25 of the principal. The annual rate of interest is

- Published on 05 Apr 17

a. 4%

b. 4(1/2)%

c. 9%

d. 10%

Answer | Explanation

ANSWER: 9%

Explanation:

Tip:

Simple Interest $= \frac{PRT}{100}$

Where, P = Principle, R = Rate of Interest,
T = Time period in years

Here, Simple Interest $= \frac{9}{25}$ of principal $=$

$\therefore \frac{9}{25}P = \frac{P \times R \times 4}{100}$

$\therefore$ **R = 9%**

COMPOUND INTEREST

1) What will be ratio of simple to compound interest on two same sums invested in SBI at rate of interest of 8% kept for 3 years?

- Published on 08 May 17

a. 1875/2029

b. 1/2.5

c. 1903/2156

d. 4/9

Answer | Explanation

ANSWER: 1875/2029

Explanation:

$$\text{Simple Interest} = \frac{PRT}{100}$$

For compound Interest, **Total Amount** $= P\left(1 + \frac{R}{100}\right)^n$

Where, P = Principal, R = Rate of interest; T and n = Time period

$$\therefore \text{Compound Interest} = \text{Amount} - \text{Principal} = P\left(1 + \frac{R}{100}\right)^n - P$$

$$\therefore \frac{\text{Simple Interest}}{\text{Compund Interest}} = \frac{\frac{P \times 8 \times 3}{100}}{P\left(\left(1+\frac{8}{100}\right)^3 - 1\right)}$$

$$= \frac{\frac{24}{100}}{\left(\frac{27}{25}\right)^3 - 1)}$$

$$= \frac{\frac{24}{100}}{\frac{27^3 - 25^3}{25^3}}$$

$$= \frac{25^3}{27^3 - 25^3} \times \frac{24}{100}$$

$$= \frac{25 \times 25 \times 6}{27^3 - 25^3}$$

We know that, $(a^3-b^3) = (a-b)(a^2+ab+b^2)$

$$= \frac{625 \times 6}{(27-25)(27^2+27 \times 25+25^2)}$$

$$= \frac{625 \times 3}{729+675+625}$$

$$= \frac{\mathbf{1875}}{\mathbf{2029}}$$

---

2) Raju invested Rs. 77500 in ICICI bank. In two years how much compound interest will he get, if the first year rate of interest was 10% and second year had 2% more than first year?

- Published on 08 May 17

a. Rs. 17850

b. Rs. 17980

c. Rs. 18963

d. Rs. 16880

Answer | Explanation

ANSWER: Rs. 17980

Explanation:

Rate of Interest for Year 1 = 10%

Rate of Interest for Year 2 = 10+2 = 12%

For compound Interest, **Total Amount** $= \mathbf{P\left(1+\frac{R}{100}\right)^{n}}$

$\therefore$ Compound Interest $= \text{Amount} - \text{Principal} = P\left(1+\frac{R}{100}\right)^{n} - P$

$= 77500\left(\left(1+\frac{10}{100}\right)^{1} \times \left(1+\frac{12}{100}\right)^{1} - 1\right)$

$= 77500\left(\frac{11}{10} \times \frac{112}{100} - 1\right)$

$= 77500\left(\frac{1232}{1000} - 1\right)$

$= 775 \times \left(\frac{232}{10}\right)$

$= 155 \times 116 =$ **Rs. 17980**

---

3) What will be difference in population 3 years ago and 2 years ago of Devon village, whose current population is 100000 and which is increasing at a rate of 25% every year?

- Published on 08 May 17

a. 15250

b. 13900

c. 16400

d. 12800

Answer | Explanation

ANSWER: 12800

Explanation:

Tip:

Population n years ago $= \frac{P}{(1 \pm \frac{R}{100})^n}$

P = present population; n= years

R = Rate of increase/decrease

Using formula given above -

Population 3 years ago $= \frac{100000}{(1+\frac{25}{100})^3} = \frac{100000}{(\frac{5}{4})^3} = \frac{100000 \times 64}{125}$

Population 3 years ago $= \frac{100000}{(1+\frac{25}{100})^2} = \frac{100000}{(\frac{5}{4})^2} = \frac{100000 \times 16}{25}$

Population difference $= \frac{100000 \times 16}{25} - \frac{100000 \times 64}{125}$

∴ Population difference $= \frac{100000 \times 16 \times 5 - 100000 \times 64}{125}$

∴ Population difference $= \frac{100000 \times 16}{125}(5-4) = 800 \times 16 = \mathbf{12800}$

---

4) A has two grandsons P and Q. 13 year old P gets some money from A's wealth and 14 year old Q gets rest of the money. But P and Q will get money only when they turn 25 years old. Till then the money is in a bank getting interest at rate 4% compounded annually. When both turn 25, they receive the same amount. How much had A given Q initially, if total money with A was Rs.25500?

- Published on 08 May 17

a. Rs. 12500

b. Rs. 13000

c. Rs. 15000

d. Rs. 11500

Answer | Explanation

ANSWER: Rs. 13000

Explanation:

Let P get Rs. M

∴ Q got Rs. (25500-M)

P will turn 25 in (25-13=) 12 years

Q will turn 25 in (25-14=) 11 years

∴ Amounts are in bank for 12 years in case of P and 11 years in case of Q

We know that, both got same amount.

For compound Interest, **Total Amount** $= \mathbf{P}\left(\mathbf{1} + \frac{\mathbf{R}}{\mathbf{100}}\right)^{\mathbf{n}}$

$\therefore M\left(1 + \frac{4}{100}\right)^{12} = (25500 - M)\left(1 + \frac{4}{100}\right)^{11}$

$\therefore M\left(1 + \frac{4}{100}\right)^{1} = 25500\text{-}M$

$\therefore \frac{26M}{25} = 25500\text{-}M$

$\therefore 26M = 25 \times 25500 - 25M$

$\therefore$ M = Rs. 12500 = Amount received by P

Amount which Q received initially from A = 25500-12500 = Rs. 13000

---

5) Raj has Rs. 1301 with him. He divided it amongst his sons Prakash and Prashant and asked them to invest it at 4% rate of interest compounded annually. It was seen that Prakash and Prashant got same amount after 17 and 19 years respectively. How much did Raj give to Prashant?

- Published on 03 May 17

a. Rs. 705

b. Rs. 615

c. Rs. 676

d. Rs. 625

Answer | Explanation

ANSWER: Rs. 625

Explanation:

Let Prashant get Rs. M

∴ Prakash got Rs. (1301-M)

We know that, both got same amount.

For compound Interest, **Total Amount** $= P\left(1 + \frac{R}{100}\right)^n$

$\therefore (1301\text{-}M)\left(1 + \frac{4}{100}\right)^{17} = M\left(1 + \frac{4}{100}\right)^{19}$

$\therefore 1301\text{-}M = M\left(1 + \frac{4}{100}\right)^{2}$

$\therefore 1301\text{-}M = \frac{676M}{625}$

$\therefore 1301 \times 625 - 625M = 676M$

∴ M = Rs. 625 = Amount which Prakash receives

---

6) Shamik had invested same amount of sums at simple as well as compound interest. The time period of both the sums was 2 years and rate of interest too was same 4% per annum. At the end, he found a difference of Rs. 50 in both the interests received. What were the sums invested?

- Published on 03 May 17

a. Rs. 32550

b. Rs. 35750

c. Rs. 30000

d. Rs. 31250

Answer | Explanation

ANSWER: Rs. 31250

Explanation:

Compound Interest for 2 years – Simple Interest for 2 years = Rs. 50

Tip:

When difference between compound interest and simple interest is given for 2 years,

Remember

$$\textbf{Difference} = P\left(\frac{R}{100}\right)^2 = \frac{SI \times R}{200}$$

Where, P = principal; R = Rate of interest; SI = Simple Interest

In this case,

$$50 = P\left(\frac{4}{100}\right)^2$$

$$\therefore P = \text{Rs. } 31250$$

---

7) Sarang invested some money in HDFC at 3% rate of interest. What would be the corresponding simple interest if after 2 years, Sarang got Rs. 101.50 as compound interest?

- Published on 03 May 17

a. Rs. 1015

b. Rs. 125

c. Rs. 100

d. Rs. 150

Answer | Explanation

ANSWER: Rs. 100

Explanation:

Now here we have compound interest for 2 years.
It is very easy to solve it using below formula.

Tip:

When difference between compound interest and simple interest is given for 2 years,

Remember

$$\textbf{Difference} = P\left(\frac{R}{100}\right)^2 = \frac{SI \times R}{200}$$

Where, P = principal; R = Rate of interest; SI = Simple Interest

Let, Compound Interest for 2 years = CI = Rs. 101.50 and
Simple Interest for 2 years = SI

$\therefore$ Difference $= 101.50 - SI = \frac{SI \times 3}{200}$

$\therefore 20300 = 203SI$

$\therefore$ **SI = Rs. 100 = Corresponding simple interest**

---

8) Ramesh gets double the amount in 9 years when invested at compound interest. In how many years will the amount become four times itself?

- Published on 13 Apr 17

a. 13.5 years

b. 27 years

c. 9 years

d. 18 years

Answer | Explanation

ANSWER: 18 years

Explanation:

Let amount be Rs. 'A'
It becomes double = 2A in **9 years**.
In next **9 years** it again double i.e. becomes 2 x 2A = 4A.
So in 9+9 = **18 years the amount becomes four times itself.**

---

9) When difference between compound and simple interest for three years is Rs. 122 at 5% rate per annum, the principal is _____

- Published on 12 Apr 17

a. Rs. 24400

b. Rs. 14400

c. Rs. 18000

d. Rs. 16000

Answer | Explanation

ANSWER: Rs. 16000

Explanation:

Tip:

When difference between compound interest and simple interest is given for 3 years,

Remember

$$\textbf{Difference} = P\left(\frac{R}{100}\right)^2\left(\frac{R}{100} + 3\right)$$

Where, P = Principal; R = Rate of interest;

SI = Simple Interest

$$\therefore 122 = P\left(\frac{5}{100}\right)^2\left(\frac{5}{100} + 3\right) = P\left(\frac{1}{20}\right)^2\left(\frac{1}{20} + 3\right)$$

$$\therefore 122 = P\left(\frac{1}{400}\right)\left(\frac{61}{20}\right)$$

$$\therefore \textbf{P} = \textbf{Rs. 16000} = \textbf{Principal}$$

---

10) If at same rate of interest, in 2 years, the simple interest is Rs. 40 and compound interest is Rs. 41, then what is the principal?

- Published on 12 Apr 17

a. Rs. 500

b. Rs. 400

c. Rs. 800

d. Rs. 820

Answer | Explanation

ANSWER: Rs. 400

Explanation:

For 2 years,

Compound Interest – Simple Interest = Rs. 41 – Rs. 40 = Re. 1

Tip:

When difference between compound interest and simple interest is given for 2 years,

Remember

Difference $= \mathbf{P(\frac{R}{100})^2 = \frac{SI \times R}{200}}$

Where, P = Principal; R = Rate of interest; SI = Simple Interest

In this case,

$1 = \frac{40 \times R}{200}$

$\therefore \mathbf{R = 5\%}$

Also, Difference $= P(\frac{R}{100})^2$

$1 = P(\frac{5}{100})^2$

$\therefore \mathbf{P = Rs.\ 400}$