RATIO and PROPORTION – Students3k.com

1. In what ratio must rice at Rs.30 per kg mixed with rice at Rs.10.80 per kg so that the mixture be worth Rs.10per kg

Ans: 8:7

Basic Formula:

If 2 ingredients are mixed, then the required ratio is given by, **the rule of allegation**

C.P of a unit quantity of cheaper (c) **C.P. of a unit quantity of dearer (d)**

∴ Required ratio is **cheaper quantity : dearer quantity = (d-m) : (m-c)**

Answer with Explanation:

By the rule of allegation

i. C.P of 1 Kg of rice of I kind (p) = 930

ii. C.P of 1 Kg of rice of II kind (p) = 1080

iii. Mean price (p) = 1000

iv. d – m = 1080-1000 = 80

v. m – c = 1000 – 930 = 70

∴ **Required ratio = 80 : 70 = 8 : 7**

2. In what ratio must wheat at Rs.3.20 pe rkg be mixed with wheat at Rs.2.90 per kg so that the mixture be worth Rs.3.08 per kg **Ans:3:2**

Basic Formula:

If 2 ingredients are mixed, then the required ratio is given by, **the rule of allegation**

C.P of a unit quantity of cheaper (c) **C.P. of a unit quantity of dearer (d)**

∴ Required ratio is **cheaper quantity : dearer quantity = (d-m) : (m-c)**

Answer with Explanation:

Given

i. C.P of a unit quantity of I kind (p) = 3.20

ii. C.P of a unit quantity of II kind (p) = 2.90

iii. Mean price (p) = 3.08

iv. d – m = 3.08 – 2.90 = 0.18

v. m – c = 3.20 – 3.08 = 0.12

∴ **Required ratio = 0.18 : 0.12 = 3 : 2**

3. How many kilograms of sugar costing Rs/.9 per kg must be mixed with 27kg of sugar costing Rs.7 per kg so that there may ba gain of 10% by selling the mixture at Rs.9.24 per kg ? **Ans:63kg**

Basic Formula:

i. If S.P and gain are given, C.P = $\left[\frac{100}{100+gain\%}xS.P\right]$ **Rs.**

ii. The rule of allegation

∴ Required ratio is **cheaper quantity : dearer quantity = (d-m) : (m-c)**

Answer with Explanation:

Step I : S.P of 1 kg of mixture = Rs. 9.24

Gain = 10%

∴ C.P of 1 kg of mixture = $\left[\frac{100}{100+10}x9.24\right]$ = Rs. 8.40

∴ Mean price = Rs. 8.40/-

Step (ii) By the rule of allegation

vi. C.P of 1 kg of sugar of I kind (p) = 900

vii. C.P of 1 kg of sugar of II kind (p) = 700

viii. Mean price (p) = 840

ix. d – m = 900 - 840 = 60

x. m – c = 840 – 700 = 140

∴ Required ratio = 140 : 60 = 7 : 3

Step (iii) Let x kg of sugar of I kind be mixed with 27 kg of II kind

∴ **7 : 3 = x : 27 ⇒ 7/3 = x/27 ⇒ x = 7/3 x 27 = 63 kg.**

4. In what ratio must water be mixed with milk to gain 16 2/3% on selling the mixture at cost price ? **Ans: 1:6**

Basic Formula:

iii. If S.P and gain are given, C.P = $\left[\frac{100}{100+gain\%}xS.P\right]$ **Rs.**

iv. The rule of allegation

∴ Required ratio is **cheaper quantity : dearer quantity = (d-m) : (m-c)**

Answer with Explanation:

Step i) Let C.P of 1 litre of mild be Rs.1

And S.P of1 litre of mild be Rs.1

Gain = 50/3 per cent

∴ **C.P of 1 litre of mixture =** $\left[\frac{100}{100+\frac{50}{3}}x1\right]$

= Re. 100 x 3/350 x 1 = 6/7 (Mean price)

Step (ii) By the rule of allegation

I. C.P of 1 liter of water = 0

II. C.P of 1 liter of milk = 1

III. Mean price (p) = 6/7

IV. d – m = 1 – 6/7 = 1/7

V. m – c = 6/7 - 0 = 6/7

∴ **ratio of water and milk = 1/7 : 6/7 = 1 : 6**

5. Two vessels A and B contain milk and water mixed in the ratio 8:5 and 5:2 res. The ratio in which these two mixtures be mixed to get a new mixture containing milk and a water in the ratio 9:4? **Ans:2:7**

Basic Formula:

Rule of allegation

Answer with Explanation:

Step (i) : Let C.P. of milk be Re.1

Given ratio of mixture in A = 8:5

∴ Milk in 1 lit mixture in A = 8/13 lit

∴ C.P of 1 lit mixture in A = Rs. 8/13

Ratio of Mixture in B = 5:2

∴ milk in 1 litre mixture in B – 5/7 lit

∴ C.P of 1 lit mixture in B = Rs. 5/7

Ratio of new mixture = 9:4

∴ milk in 1 lit mixture = 9/13

C.P of 1 lit mixture = Rs/ 9/13 (Mean price)

Step (ii) : By the rule of allegation,

i. C.P of 1 liter of mixture in A =8/13

ii. C.P of 1 liter of mixture in B = 5/7

iii. Mean price (p) = 9/13

iv. d – m = 9/13 – 5-7 = 2/91

v. m – c = 9/13 – 8/13 = 1/13

∴ **Required ratio = 2/91 : 1/13 = 2:7**

6. In what ratio water be mixed with milk costing Rs.12 per liter to obtain a mixture worth of Rs.8 per litre? **Ans 1:2**

Basic Formula:

Rule of Alligation

Answer with Explanation:

By the rule of allegation,

i. C.P of 1 liter of water = 0

ii. C.P of 1 liter of milk = 12

iii. Mean price (p) = 8

iv. d – m = 12-8 = 4

v. m – c = 8-0 = 8

∴ **Ratio of water and milk = 4 : 8 = 1 : 2**

7. A sum of Rs.4000 is lent out in two parts, one at 8% simple interest and the other at 10% simple interest. In the annual interest is Rs.352, the sum lent at 8% is **Ans:Rs.2400**

Basic Formula:

S.I = PNR/100

Answer with Explanation:

Step (i) Given the total sum = Rs. 4000

Let the sum lent at 8% be Rs.x

Ie) P = x , n=1, R = 8%

$$\frac{xX1X8}{100} = \frac{8x}{100}$$

Let the sum lent at 10% be Rs. 4000 – x

P = 4000-x , n=1, R = 10%

$$\frac{4000-xX1X10}{100} = \frac{40000-10x}{100}$$

Given annual interest = Rs. 352

$$\frac{8x}{100} + \frac{40000-10x}{100} = 352$$

8x – 10x = 35200 – 40000

-2x = -4800

X = $\frac{4800}{2}$ **= Rs.2400/-**

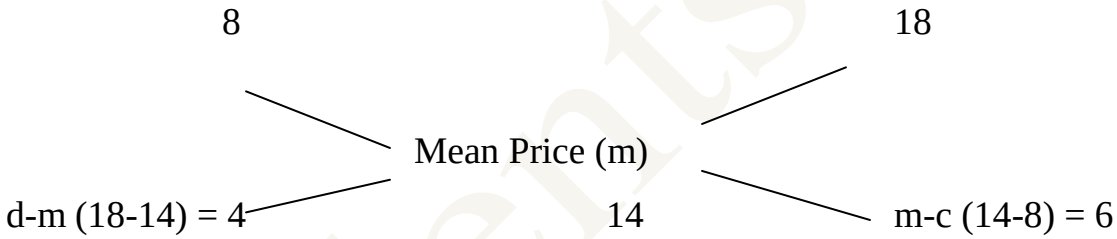
8. A merchant has 1000kg of sugar, part of which he sells at 8% profit and the rest at 18% profit. He gains 14% on the whole. The quantity sold at 18% profit is **Ans:600kg**

Basic Formula:

Rule of Allegation

Answer with Explanation:

Profit on I kind (%) (c) Profit of II kind (d)



Ratio of Profits on I and II kind = 4:6 = 2:3

Step (ii) Quantity sold at 18% profit = (3/5 x 1000) kg

= 600 kg.

9. Two vessels A and B contain milk and water mixed in the ratio 4:3 and 2:3 in what ratio must these mixtures be mixed to form new mixture containing half milk and half water**? Ans: 7:5**

Basic Formula:

Rule of Alligation

Answer with Explanation:

Step (i): Let C.P. of 1 liter milk be Re.1

Ratio of mixture in A = 4:3

∴ Milk in 1 litre mixture in A = 4/7 lit, ∴ C.P of 1 litre mix of A = Rs. 4/7

Ratio of mix in B = 2:3

∴ Milk in 1 litre mixture in B = 2/5 lit, ∴ C.P of 1 litre mix of B = Rs. 2/5

Ratio of new mixture = 1:1

∴ Milk in 1 litre mixture = 1/2 lit, ∴ C.P of 1 litre mix = Rs. ½

(Mean price = re. ½)

Step (ii) By the rule of alligation

C.P. of 1 lit mix. In A (d) C.P. of 1 lit mix. In B (c)

4/7 2/5

Mean Price (m)

m-c (1/2 – 2/5) = 1/10 1/2 d-m (4/7 – 1/2) = 1/14

∴ **Required Ratio = 1/14 : 1/10 = 7 : 5**

10. A jar full of whisky contains 40% alcohol. A part of this whisky is replaced by another containing 19% alcohol and now the percentage of alcohol was found to be 26% the quantity of whisky replaced is **ans : 2/3**

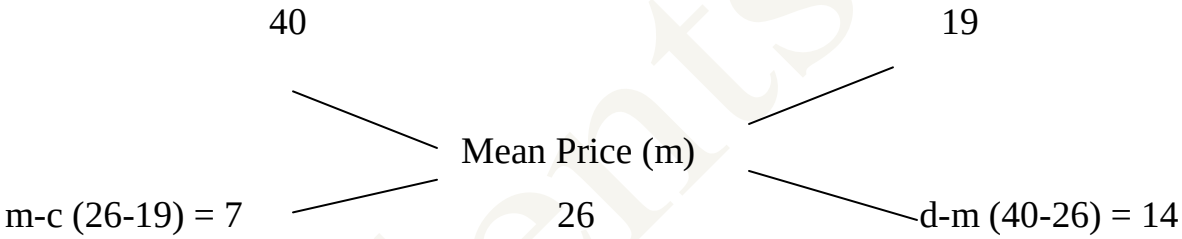
Basic Formula:

Rule of Alligation

Answer with Explanation:

Step (i) : By the rule of Alligation

Strength of I kind (%) (d) Strength of II kind (c)



∴ Ratio of I and II kind = 7: 14 = 1:2

Step (ii) : Quantity of whisky replaced in II kind = 2/3

11.729ml of mixture contains milk and water in the ratio 7:2 how much more wate is to be added to get a new mixture containing milk and water in the ratio 7:3? **Ans 81ml**

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts and ratios

a: b = a/b

Answer with Explanation:

Ratio of milk and water in 729 ml = 7:2

Step (i) Milk in 729 ml of mixture = (7/9 x 729) ml = 567 ml

∴ water in 729 ml of mixture = 729 – 567 = 162 ml

Step (ii) Let x be the quantity of water added to new mixture, with the ratio 7:3

∴ Quantity of water in the new mixture = (162 + x) ml

Then $7/3 = \frac{567}{162 + x}$

⇒ 7 (162 + x) = 3 x 567

⇒ 1134 + 7x = 1701

7x = 1701 – 1134

X = 567/7 = 81 ml

∴ **Quantity of water added to new mixture = 81 ml.**

12. A sum of Rs.312 was divided among 100 boys and girls in such a way that the boy gets Rs.3.60 and each girl Rs.2.40 the number of girls is **Ans:40**

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Solving simultaneous equations

Answer with Explanation:

Step (i) Let x be the number of boys and y be the number of girls.

Given total number of boys and girls = 100

$\therefore$ x + y = 100 ---------- (i)

Step (ii) A boy gets Rs. 3.60 and a girl gets Rs. 2.40

The amount given to 100 boys and girls = Rs. 312

$\therefore$ 3.60x +2.40y = 312 ----------(ii)

Step (iii)

Solving (i) and (ii)

(i) x 3.60 $\Rightarrow$ 3.60 x + 3.60y = 360 (-)

(ii) $\Rightarrow$ 3.60 x + 2.40y = 312

1.20y = 48

Y = 48 / 1.20 = 40

$\therefore$ **Number of girls = 40**

13. A sum of rs.36.90 is made up of 180 coins which are either 10 paise coins or 25 p coins. The number of 10 p coins is **ans:54**

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Conversion of paise into rupees

Solution of equations

Answer with Explanation:

Step (i) Total number of coins = 180

Let x be number of 10p coins and y be number of 25p coins

X + y = 180 ----------(i)

Step (ii) Given 10p coins and 25p coins make the sum = Rs. 36.90

$\therefore \frac{10x}{100} + \frac{25y}{100} = 36.90$

$\Rightarrow$ 10x +25y = 3690 ---------(ii)

Step (iii)

Solving (i) and (ii)

(i) x 10 $\Rightarrow$ 10 x + 10y = 1800 (-)

(ii) $\Rightarrow$ 10x +25y = 3690

- 15y = -1890

Y = 1890 / 15 = 126

Substitute y value in equation (i) , X = 180 – 126 = 54

$\therefore$ **Number of 10p coins = 54**

14. A dishonest milk man professes to sell his milk at cost price but he mixed it with water and thereby gains 25%. The percentage of water in the mixture is **ans:20%**

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

C.P = $\left[\frac{100}{100+gain\%}xS.P\right]$

The rule of allegation

∴ Required ratio is **cheaper quantity: dearer quantity = (d-m): (m-c)**

Answer with Explanation:

Step i) Let C.P of 1 litre of milk be Rs.1

And S.P of 1 litre of mixture be Rs.1

Gain = 20 per cent

∴ **C.P of 1 litre of mixture =** $\left[\frac{100}{100+25}x1\right]$

= Re. 100 /125 = Rs. 4/5 (Mean price)

Step (ii) By the rule of allegation

i. C.P of 1 liter of water = 0

ii. C.P of 1 liter of milk = 1

iii. Mean price (p) = 4/5

iv. d – m = 1 – 4/5 = 1/5

v. m – c = 4/5 - 0 = 4/5

∴ ratio of milk to water = 4/5 : 1/5 = 4:1

∴ **Percentage of water in the mixture = (1/5 x 100)% = 20%**

15. A mixture of 20kg of spirt and water contains 10 water How much water must be added to this mixture to raise the percentage of water to 25%? **Ans 4kg**

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts of percentage

Answer with Explanation:

Step (i) Amount of water in 20 kg of mixture =10/100 x 20= 2 kg

Step (ii) Let x kg of water be added with the mixture to increase 25% of water

$\therefore \frac{2+x}{20+x} = \frac{25}{100}$

$\Rightarrow (2 + x)\ 100 = 25\ (20 + x)$

$\Rightarrow 200 + 100x = 500 + 25x$

$\Rightarrow 100x - 25x = 500 - 200$

$\Rightarrow 75x = 300$

$X = 4$ kg

$\therefore$ **4 Kg of water must be added to the mixture.**

16. A can contains 40kg of milk, from this container 4kg of milk was taken out and replaced by water. This process was repeated further two times. How much milk is now contained by the container? **Ans:29.16kg**

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Suppose a container contains x kg of liquid from which y kg are taken out and replaced by water. After n operations, the quantity of liquid = $\left[x\left(1-\frac{y}{x}\right)^n\right]kg$

Answer with Explanation:

Quantity of milk in the can x = 40 kg

Quantity of milk taken out y = 4 kg

Number of times = 3

$\therefore$ Quantity f milk in the can = $\left[x\left(1-\frac{y}{x}\right)^n\right]kg$

$= \left[40\left(1-\frac{4}{40}\right)^3\right]kg$

$= 40\ (9/10)^3$ kg

$= 40\ (\ 729/1000)$

$\therefore$ **quantity of milk in the can = 29.16 kg**

17. A can contains a mixture of two liquids A and B in the ratio 7:5 when 9 litres of mixture are drawn off and the can is filled with B, the ratio of A and B becomes 7:9 how many litres of liquids A was contained by the can initially? **Ans:21**

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts of mixtures and ratios

Answer with Explanation:

Step (i) : Let the can contain 7x and 5x litres of mixtures A and B respectively. Quantity of mixture drawn off = 9 lit

$\therefore$ **quantity of A in mixture left =** $\left(7x - \frac{7}{12}x9\right)$ **litre**

$= \left(7x - \frac{21}{4}\right)$ **litre**

Quantity of B in mixture left = $\left(5x - \frac{5}{12}x9\right)$ **litre**

$= \left(5x - \frac{15}{4}\right)$ **litre**

Step (ii) Since the mixture is in the ratio 7:9,

$$\frac{\left(7x - \frac{21}{4}\right)}{\left(5x - \frac{15}{4}\right) + 9} = \frac{7}{9} \Rightarrow \frac{28x - 21}{20x + 21} = \frac{7}{9}$$

$\Rightarrow 252x - 189 = 140x + 147$

$\Rightarrow 112x = 336$

$\Rightarrow x = 3$

$\therefore$ **Quantity of liquid A, contained in the can initially = 7 X 3 = 21 lit**

18. The ratio between the present ages of P and Q is 6 : 7. If Q is 4 years old than P, what will be the ratio of the ages of P and Q after 4 years?

a. 3 : 4 b. 3 : 5 c. 4 : 3

d. None of these

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts of ratios

Answer with Explanation:

Let P's age and Q's age be 6x years and 7x years respectively

Given Q is 4 years older than P

$\therefore$ 7x - 6x = 4

X = 4

After 4 years, P's age is 6x + 4 years

And Q's age is 7x + 4

$\therefore$ Required ratio = 6x + 4 : 7x + 4

Substitute the x value of 4

= 28 : 32

= 7 : 8

Answer : None of the above

19. At present, the ratio between the ages of Arun and Deepak is 4 : 3. After 6 years, Arun's age will be 26 years. What is the age of Deepak at present?

a. 12 years **b. 15 years** c. 19 years d. 49 years

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Answer with Explanation:

Step (i) : Let the present ages of Arun and Deepak be 4x and 3x respectively.

After 6 years , Arun's age is 4x +6 years

Step (ii) : It is given that after 6 years, Arun's age will be 26 years.

$\therefore$ 4x + 6 = 26

$X = \frac{26-6}{4} = 5$

$\therefore$ **Deepak's Present age = 3 x 5 = 15 years.**

20. The length and breadth of a rectangle are increased in the ratio 3:4 and 4:5 respectively. What is the ratio of the old area to the new one?

Answer: 3:5

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Area of the rectangle = length x breadth

Answer with Explanation:

Step (i) : Let the original length be 3x

And the original breadth be 4 x

$\therefore$ Area = 3x X 4x

= 12 x^2

Step (2) : New length = 4x , New breadth = 5x

$\therefore$ New area = 4x X 5x

= 20 x^2

Ratio of old area to new area = 12 x^2 : = 20 x^2

= 12 : 20

= 3 : 5

21. 3 pots have same volume. The ratios of milk and water in 1^{st} , 2^{nd} and 3^{rd} pots are respectively 3:2, 7:3 and 11:4. If all the 3 pots are mixed, find the ratio of milk and water in the mixture?

Answer: 61:29

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts of ratios

Answer with Explanation:

Step(i) : Since 3 pots have the same volume, let them contain x litres of mixtures.

Ratio of mixture in 1^{st} pot = 3:2

Then milk in the 1^{st} pot = xX3/5 = 3x / 5 litres

$\therefore$ Water in 1^{st} pot = 2x/5 litres

Ratio of mixture in 2^{nd} pot = 7:3

Then milk in the 2^{nd} pot = 7x / 10 litres ; Water in 2^{nd} pot = 4x/10 litres

Ratio of mixture in 3^{rd} pot = 11:4

Then milk in the 3^{rd} pot = 11x / 15 litres, Water in 3^{rd} pot = 4x/15 litres

Step (ii): Total milk in final mix = $\frac{3x}{5}+\frac{7x}{10}+\frac{11x}{15} = \frac{61x}{30}$ litres

Total water in final mix = $\frac{2x}{5}+\frac{3x}{10}+\frac{4x}{15} = \frac{29x}{30}$ litre

$\therefore$ Required ratio of milk and water in the final mix $= \frac{61x}{30} : \frac{29x}{30}$

= 61 : 29

22. One alloy contains silver and copper in the ratio 5:1 and the other contains in the ratio 7:2 respectively. What weights of the 2 must be melted together, so as to make a 5 lb mass with 80% silver?

Answer : 2 lb, 3 lb

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Rule of allegation

Facts on Percentages

Answer with Explanation:

Step (i) Silver in I kind = 5/6

Silver in II kind = 7/9

Silver in Final mix = 80/100 = 4/5 (mean wt)

Step (ii) By the rule of allegation,

Silver in I kind (%) (d) 5/6 Silver in II kind (c) 7/9

Mean wt (m)

m-c (4/5-7/9) = 1/45 4/5 d-m (5/6 – 4/5) = 1/30

∴ required ratio = 1/45 : 1/30 = 45 :30 = 3 : 2

∴ **The weights of 2 quantities = 2lb +3lb = 5lb**

23. In what ratio must water be mixed with milk to gain 20% by selling the mixture at cost price?

Answer:1:5

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

C.P = $\left[\frac{100}{100+gain\%}xS.P\right]$ **Rs.**

The rule of allegation

∴ Required ratio is **cheaper quantity : dearer quantity = (d-m) : (m-c)**

Answer with Explanation:

Step I : Let C.P. of 1 lr milk be Re. 1

S.P of of 1 lr milk = Re.1

Gain = 20%

$$\therefore \text{ C.P of 1 kg of mixture} = \left[\frac{100}{100+20}x1\right] = \frac{100}{120} = \text{Re. } 5/6$$

∴ Mean price = Rs. 5/6

Step (ii) By the rule of allegation

i. C.P of 1 lr of water (c) = 0

ii. C.P of 1 lr of milk (d)= 1

iii. Mean price (m) = Re. 5/6

iv. d – m = 1 – 5/6 = 1/6

v. m – c = 5/6 – 0 = 5/6

∴ **Ratio of water and milk = 1/6 : 5/6 = 1: 5**

24. Two vessels A and B contain sprit and water in the ratio 5:2 and 7:6 respectively. Find the ratio in which these mixture be mixed to obtain a new mixture containing sprit and water in the ratio 8:5?

Answer: 7:9

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Rule of alligation

Answer with Explanation:

Step (i) : Spirit in 1 lr mixture of A = 5/7 lr

Spirit in 1 lr mixture of B = 7/13 lr

Spirit in 1 lr mixture of final mixture = 8/13 lr

Mean quantity = 8/13 lr

Step (ii) By the rule of allegation,

i. quantity of spirit in A (c) = 5/7

ii. Quantity of spirit in B (d)= 7/13

iii. Mean price (m) = 8/13

iv. d – m = 5/7 – 8/13 = 9/19

v. m – c = 8/13 – 7/13 = 1/13

∴ **Required ratio = 1/13 : 9/91 = 7 : 9**

25. Two vessels A and B contain milk and water mixed in the ratio 8:5 and 5:2 respectively. The ratio in which these 2 mixtures be mixed to get a new mixture containing 69 3/13 % milk is :

Answer: 2:7

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Rule of alligation

Facts on Percentages

Answer with Explanation:

Step (i) : Quantity of milk in 1 lr mixture of A = 8/13 lr

Quantity of milk in 1 lr mixture of B = 5/7 lr

Quantity of milk in 1 lr mixture of final mixture $= 69\ \frac{3}{13}\ \%$

$= \left(\frac{900}{13} x \frac{1}{100}\right) \text{lr}$

Mean quantity = 9/13 lr

Step (ii) By the rule of allegation,

vi. quantity of spirit in A (c) = 8/13

vii. Quantity of spirit in B (d)= 5/7

viii. Mean price (m) = 9/13 lr

ix. d – m = 5/7 – 9/13 = 2/91

x. m – c = 9/13 – 8/13 = 1/13

∴ **Required ratio = 2/91 : 1/13 : = 2 : 7**

26. The cost of type I rice is Rs.15 p/kg and type II is Rs.20p/kg. Both are mixed in the ratio 2:3, price P/Kg of the mixed variety is :

Answer: Rs.18

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Rule of alligation

Facts on ratio

Answer with Explanation:

Step (i) : Let the price of mixed variety be x.Rs

Mean price = Rs.x

Cost of 1 kg of Type I (c) Rs. 15 — Cost of 1 kg of Type II (d) Rs.20

Mean wt (m)

d-m (20 - x) — Rs.x — m –c (x - 15)

∴ ratio = 20-x : x - 15

Step (ii) : Mixed variety is in the ratio = 2:3

$\therefore \frac{20-x}{x-15} = 2/3$

60 – 3x = 2x – 30

X = 90 / 5 = 18

Ratios imply that the price of mixture = Rs. 18 per kg

27. At an election, a candidate who gets 62% of the total votes polled, is selected by a majority of 144 votes. The total number of votes polled and the number of votes secured by the candidate, who was elected a re respectively

a) 600 : 228 **b) 600: 372** c) 800 : 228 d) 800 : 372

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts on Percentages

Answer with Explanation:

Step (i) : Let the total Number of votes polled be x

Votes polled to the candidate = 62% of x

Votes polled to other candidate = (100-62) % of x = 38% of x

Step (ii) : 62% of x – 38% of x = 144

24% of x = 144

$\frac{24x}{100} = 144$

$X = \frac{14400}{24} = 600$

∴ Total number of votes polled = 600

∴ Number of votes secured by the candidate = 62% of 600

$= \frac{62}{100} \times 600 =$ **372**

28. The population of a town is 35,000. If the certain years males increases by 6% and females by 4% the population will be 36760. Find the number of males and females

a) Male : 18,000 ; Female: 17,000

b) Male : 17,000 ; Female: 18,000

c) Male : 17,5000 ; Female: 17,500

d) None of these

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts on Percentage

Answer with Explanation:

Total Population = 35000

Let the number of male be x and the number of females be (35000-x)

$\therefore$ Increase in population = 6% of x + 4% of 35000-x

= 36760 – 35000

$$\frac{6x}{100} + \frac{4(35000 - x)}{100} = 1760$$

6x +140000 – 4x = 176000

2x = 176000 – 140000

2x = 36000

X = 18000

Number of males = 18000

Number of females = 35000 – 18000 = 17000

29. If 12 men and 16 boys can do a piece of work in 5 days. 13 men and 24 boys can do it in 4 days then the ratio of the daily work done by a man to that of a boy is

a) 2:1 b) 3:1 c) 3:2 d) 5:4

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts on Ratios

Solution of equations

Answer with Explanation:

Let 1 man's one day work be x and 1 boy's one day work be y

Given , 12x + 16y = 1/5 ----------(1)

13x + 24 y = ¼ ----------(2)

Solving (1) and (2) , we get x = 1/100 and y = 1/200

∴ **Required ratio = 1/100 : 1/200 = 2:1**

30. From the salary of an officer, 10% is deducted as house rent, 20% of the rest, he spends on conveyance, 20% of the rest he pays as income tax and 10% of the balance, he spends on clothes. Then, he is left with Rs.15, 552. Find his total salary.

a. Rs.25, 000 **b. Rs.30, 000** c. Rs.35, 000

d. Rs.40, 000

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts on Percentage

Answer with Explanation:

Let the total salary be Rs. X

Then (100 – 10) % (100-20)% of (100-20)% of (100 – 10) % = Rs. 15552

$\therefore \left[\frac{90}{100} x \frac{80}{100} x \frac{80}{100} x \frac{90}{100} xX\right] = 15552$

$X = \frac{15552x10000}{64x81}$

= Rs. 3000

$\therefore$ **Total salary = Rs. 30000**

31. If a quarter kg of potato costs 60 paise, how many paise will 200 gm cost?

a. 48 paise b. 54 paise c. 56 paise d. 72 paise

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Direct Proportion

Answer with Explanation:

Let the required cost be x paise

Weight		Cost	
250gm	↓	60 p	↓
200 gm		x p	

Less weight, less cost = Direct proportion

∴ **Cost of 200 gm potatoes = 48 paise**

32. The average age of students of a class is 15.8 years. The average age of boys in the class is 16.4 years and that of the girls is 15.4 years. The ratio of the number of boys to the number of girls in the class is:

a. 1 : 2 **b. 2 : 3** c. 3 : 4

d. 3 : 5

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts on Ratios

Answer with Explanation:

Let the ratio of boys and girls be K : 1

Then (K x 16.4) + (1 x 15.4) = (K + 1) 15.8

(16.4 – 15.8)k = 15.8 – 15.4

K = 0.4 / 0.6 = 2/3

∴ **Required ratio K : 1 = 2/3 : 1 = 2:3**

33. What is the ratio of the present ages of Anna and her mother?

I. The sum of the ages of Anna, her mother and her father is 62.

II. Five years ago, Anna's age was one-fifth of her father's age.

III. Two years ago, the sum of the ages of Anna and her father was 36.

a. I or II only b. II or III only c. III only

d. I or III only **e. All I, II and III are required.**

Difficulty Level : Easy ☐ **Moderately easy** ☐ **Difficult** ☐

Basic Formula:

Facts on Ratios

Answer with Explanation:

Let A, M and F denote Anna, Her mother and her Father

By I , A + M +F = 62

By II, A-5 = 1/5 (F-5)

By III, (A-2) + (F-2) = 36

From II and III, we get A and F

Substituting A and F in I we get M

∴ **All I, II and III are required.**