

City Bank Ltd.

Management Trainee Officer 2018 [Exam Taker: IBA, DU]

1. A department store receives a shipment of 1,000 shirts, for which it pays Tk. 9,000. The store sells the shirts at a price 80 percent above cost for one month, after which it reduces the price of the shirts to 20 percent above cost. The store sells 75 percent of the shirts during the first month and 50 percent of the remaining shirts afterward. How much gross income did sales of the shirts generate?

Solution:

First month sold = 75% of 1000 = 750 shirts

Remaining = 1000 – 750 = 250 shirts

Second month sold = 50% of 250 = 125 shirts.

1000 shirts cost = Tk. 9000

1 shirt cost = Tk. $\frac{9000}{1000}$ = Tk. 9

Gross Income = Income of first month + Income of second month
= (180% of 9) × 750 + (120% of 9) × 125
= Tk. (12150 + 1350)
= Tk. 13500

Ans: Tk. 13500.

2. At a football game, $\frac{4}{5}$ of the seats in the lower deck obtuse stadium was sold. If $\frac{1}{4}$ of all the seating in the stadium is located in the lower deck, and if $\frac{2}{3}$ of all the seats in the stadium were sold, then what fraction of the unsold seats in the stadium was in the lower deck?

Solution:

Total number of seats be x

The number of lower deck seats = $\frac{1}{4}$ of x = $\frac{x}{4}$

The number of unsold lower deck seats = $(1 - \frac{4}{5})$ of $\frac{x}{4}$ = $\frac{x}{20}$

Total number of sold seats = $\frac{2}{3}$ of x = $\frac{2x}{3}$

Total number of unsold seats = x - $\frac{2x}{3}$ = $\frac{x}{3}$

∴ Required fraction = $\frac{\frac{x}{20}}{\frac{x}{3}} = \frac{3}{20}$ (Ans.)

এই ফাইলে আশাকরি কোন ভুল নাই।

যদি ভুল পান তাহলে **Jafar Iqbal Ansary** ID তে মসেজে দিয়ে জানাবেন।

ধন্যবাদ

Dhaka Bank Ltd.

Trainee Officer 2018 [Exam Taker: E-zone]

1. If each of 4 subsidiaries of corporation R has been granted a line of credit of Tk. 700,000 and each of the other 3 subsidiaries of Corporation R has been granted a line of credit of Tk. 112,000, what is the average (arithmetic mean) line of credit granted to a subsidiary of corporation R?

Solution:

Total granted credit = Tk. $(4 \times 700,000 + 3 \times 112,000)$
= Tk. 31,36,000

\therefore The average line of credit granted = Tk. $\frac{31,36,000}{7}$
= Tk. 4,48,000.

Ans: Tk. 4,48,000.

2. A merchant purchased a jacket for Tk. 60 and then determined a selling price that equaled the purchase price of the jacket plus a markup that was 25 percent of the selling price. During a sale, the merchant discounted the selling price by 20 percent and sold the jacket. What was the merchant's gross profit on this sale?

Solution:

Let, determined selling price be Tk. x

According to the question,

$$x = 60 + 25\% \text{ of } x$$

$$\text{Or, } x = 60 + 0.25x$$

$$\text{Or, } x - 0.25x = 60$$

$$\text{Or, } 0.75x = 60$$

$$\therefore x = 80$$

$$\therefore \text{Determined selling price} = \text{Tk. } 80$$

At 20% discount,

$$\text{selling price} = 80\% \text{ of Tk. } 80 = \text{Tk. } 64.$$

$$\therefore \text{Gross profit} = \text{Tk. } (64 - 60) = \text{Tk. } 4 \text{ (Ans.)}$$

Management Trainee Officer 2018 [Exam Taker:]

1. A shopkeeper buys 100 mangoes at Tk. 12 each. He sells 60 mangoes at Tk. 17.60 each and x mangoes at Tk. 11.31 each. The shopkeeper makes a profit of at least 10%. Find the least possible value of x ?

Solution:

$$\text{Total cost price} = \text{Tk. } (100 \times 12) = \text{Tk. } 1200$$

$$\text{At 10\% profit, selling price} = 110\% \text{ of Tk. } 1200 = \text{Tk. } 1320$$

According to the question,

$$60 \times 17.60 + x \times 11.31 = 1320$$

$$\text{Or, } 1056 + 11.31x = 1320$$

$$\text{Or, } 11.31x = 1320 - 1056$$

$$\text{Or, } 11.31x = 264$$

$$\text{Or, } x = \frac{264}{11.31}$$

$$\therefore x = 23.34 \approx 24$$

$$\therefore \text{The least possible value of } x = 24 \text{ (Ans.)}$$

2. Lamia owns a hairdressing salon. She borrows Tk. 2500 from a bank to improvements to her beauty salon. She is charged 4.5% per year compound interest. She pays the money back after 3 years. Calculate the total amount Lamia must pay to the bank. (Dhaka Bank MTO 18)

Solution:

Here,

Principal, $P = \text{Tk. } 2500$, Rate of interest, $r = 4.5\%$ and Time, $n = 3$ years.

We know,

$$\begin{aligned}\text{Compound amount} &= P(1+r\%)^n \\ &= 2500(1+4.5\%)^3 \\ &= \text{Tk. } 2852.92\end{aligned}$$

Ans: Tk. 2852. 92

3. Factorise: $4t^2 + 35t - 9$

Solution:

$$\begin{aligned}&4t^2 + 35t - 9 \\ &= 4t^2 + 36t - t - 9 \\ &= 4t(t+9) - 1(t+9) \\ &= (t+9)(4t-1) \text{ (Ans.)}\end{aligned}$$

4. To make a pizza, the following round baking tray is completely filled with dough to a depth of d mm. The open cylinder holds 500cm^3 of dough. Calculate the depth of the dough, d mm, giving your answer correct to the nearest millimeter.



Solution:

Given that,

$$\text{Volume of the cylinder} = 500 \text{ cm}^3 = (500 \times 1000) \text{ mm}^3 = 500000 \text{ mm}^3$$

$$\text{Radius, } r = 15.5 \text{ cm} = (15.5 \times 10) \text{ mm} = 155 \text{ mm} \quad [10 \text{ mm} = 1\text{cm}]$$

$$\text{Height, } h = d \text{ mm}$$

According to the question,

$$\text{Volume of the cylinder} = \pi r^2 h$$

$$\text{Or, } 500,000 = \frac{22}{7} \times (155)^2 \times d$$

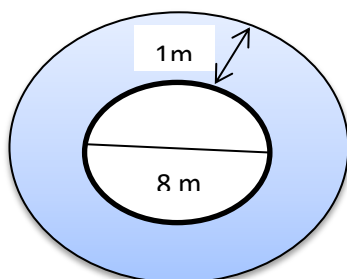
$$\text{Or, } 500,000 = \frac{22}{7} \times 24025 \times d$$

$$\text{Or, } d = \frac{500,000 \times 7}{22 \times 24025}$$

$$\therefore d = 6.621 \approx 7 \text{ mm (The nearest millimeter)}$$

Ans: 7 mm.

5. The diagram shows the cross section of a circular tunnel in the city. Calculate the shaded area.



Solution:

Given that,

Diameter of inner circle = 8 m

∴ Radius of the inner circle, $r = \frac{8}{2} \text{ m} = 4 \text{ m}$

So, radius of the outer circle, $R = (4+1) \text{ m} = 5 \text{ m}$

∴ The shaded area = $(\pi R^2 - \pi r^2) \text{ sq.m.}$
 $= (\pi 5^2 - \pi 4^2) \text{ sq.m.}$
 $= (25\pi - 16\pi) \text{ sq.m.}$
 $= 9\pi \text{ sq.m.}$

Ans: $9\pi \text{ sq.m.}$

Trainee Assistant Cash Officer 2018 [Exam Taker: Business Faculty, DU]

1. A depositor deposited Tk. 4000 at $x\%$ simple interest and Tk. 5000 at $y\%$ simple interest. He received annual interest of Tk. 320 on his deposited amounts at the year end. If he could deposit Tk. 5000 at $x\%$ simple interest and Tk. 4000 at $y\%$ simple interest, he would receive annual interest of Tk. 310. Find the value of x and y . (Janata Bank Financial Analyst 15)

Solution:

According to the question,

Condition-1

$x\%$ of 4000 + $y\%$ of 5000 = 320

Or, $\frac{x}{100} \times 4000 + \frac{y}{100} \times 5000 = 320$

Or, $40x + 50y = 320$

∴ $4x + 5y = 32$ ----- (i)

Condition-2

$x\%$ of 5000 + $y\%$ of 4000 = 310

Or, $\frac{x}{100} \times 5000 + \frac{y}{100} \times 4000 = 310$

Or, $50x + 40y = 310$

∴ $5x + 4y = 31$ ----- (ii)

Now, (i) $\times 5$ - (ii) $\times 4 \Rightarrow$

$25y - 16y = 160 - 124$

Or, $9y = 36$

∴ $y = 4$

Putting the value of y in the equation (ii), we get

$5x + 4 \times 4 = 31$

Or, $5x = 31 - 16$

Or, $5x = 15$

∴ $x = 3$

Ans: $x = 3$ and $y = 4$

2. If 12 candies are sold for Tk. 10 then there is a loss of $x\%$. If 12 candies are sold for Tk. 12 then there is a profit of $x\%$. What is the value of x ? (South East Bank PO 17)

Solution:

Let, cost price be Tk. 100.

∴ At $x\%$ loss, selling price = Tk. $(100 - x)$

If selling price Tk. (100-x) then cost price Tk. 100

If selling price Tk. 10 then cost price Tk. $\frac{100 \times 10}{100-x}$

Similarly, at x% profit

Selling price = Tk. (100+x)

If selling price Tk. (100+x) then cost price Tk. 100

If selling price Tk. 12 then cost price Tk. $\frac{100 \times 12}{100+x}$

According to the question,

$$\frac{100 \times 10}{100-x} = \frac{100 \times 12}{100+x}$$

$$\text{Or, } \frac{5}{100-x} = \frac{6}{100+x} \quad [\text{Dividing both sides by 200}]$$

$$\text{Or, } 5(100+x) = 6(100-x)$$

$$\text{Or, } 500+5x = 600-6x$$

$$\text{Or, } 5x+6x = 600-500$$

$$\text{Or, } 11x = 100$$

$$\therefore x = 9.09$$

$$\therefore \text{The value of } x = 9.09 \text{ (Ans.)}$$

Premier Bank Ltd

Trainee Junior Officer 2018 [Exam Taker: BIBM]

1. Rahim and Karim have equal amount of money. Runa has half of money that Rahim has. And Mina has half of money that Runa has. If you add taka 1, the sum of their money will be 100 taka. How much money Rahim has? [Premier Bank TJO-General-2018][Bangladesh Bank AD-2004] [Standard Bank TAO-Cash-2016]

Solution:

Let, Karim and Rahim each has = Tk. 4x

So, Runa has = $\frac{1}{2}$ of 4x = Tk. 2x and Mina has = $\frac{1}{2}$ of 2x = Tk. x

According to the question,

$$(x+2x+4x+4x+1) = 100$$

$$\text{Or, } 11x = 100-1$$

$$\text{Or, } 11x = 99$$

$$\therefore x = 9.$$

$$\text{So, Rahim has} = \text{Tk. } (4 \times 9) = \text{Tk. } 36 \text{ (Ans.)}$$

Alternative method:

Let, Rahim has = Tk. x.

So, Karim has = Tk. x, Runa has = Tk. $\frac{x}{2}$ and Mina has = Tk. $\frac{\frac{x}{2}}{2} = \text{Tk. } \frac{x}{4}$

According to the question,

$$x + x + \frac{x}{2} + \frac{x}{4} + 1 = 100$$

$$\text{Or, } 2x + \frac{x}{2} + \frac{x}{4} = 100 - 1$$

$$\text{Or, } \frac{8x + 2x + x}{4} = 99$$

$$\text{Or, } \frac{11x}{4} = 99$$

$$\text{Or, } x = 99 \times \left(\frac{4}{11}\right)$$

$$\therefore x = 36$$

\therefore Rahim has Tk. 36 only. (Ans.)

2. TV was marked by 120% of its cost price. Then shopkeeper sold the TV at 10% discount. After that his profit was 2400. Find the cost price.

[Premier Bank TJO 2018]

Solution:

Let, cost price be Tk. $100x$

Mark price = 120% of Tk. $100x$ = Tk. $120x$

At 10% discount, selling price = 90% of Tk. $120x$ = Tk. $108x$

Profit = Tk. $(108x - 100x)$ = Tk. $8x$

According to the question,

$$8x = 2400$$

$$\therefore x = 2400/8$$

$$\therefore 100x = \frac{2400 \times 100}{8}$$
$$= 30,000$$

\therefore Cost price = Tk. 30,000. (Ans.)

3. A garden was 60 meter long and 20 meter wide. There was 5 meter wide 4 sided path inside the garden. If it needs 20 taka per square meter to cover with grass, how much it will need to cover the path with grass? [Premier Bank TJO 2018]

Solution:

Area of the garden with path = (60×20) sq. m.

$$= 1200 \text{ sq. m.}$$

Area of the garden without path = $(60 - 5 - 5) \times (20 - 5 - 5)$ sq. m.

$$= 50 \times 10 \text{ sq. m.}$$

$$= 500 \text{ sq. m.}$$

$$\therefore \text{Area of the path} = (1200 - 500) \text{ sq. m.} = 700 \text{ sq. m.}$$

\therefore Total cost to cover the path with grass at rate of Tk. 20 per square feet

$$= \text{Tk. } (700 \times 20)$$

$$= \text{Tk. } 14,000 \text{ (Ans.)}$$

4. Solve: $\frac{10}{2x-5} + \frac{1}{x+5} = \frac{18}{3x-5}$ [Premier Bank TJO-General-2018]

Solution:

$$\frac{10}{2x-5} + \frac{1}{x+5} = \frac{18}{3x-5}$$

$$\frac{10}{2x-5} + \frac{1}{x+5} = \frac{18}{15+3}$$

$$\frac{10}{2x-5} + \frac{1}{x+5} = \frac{18}{3x-5}$$

$$\text{Or, } \frac{10}{2x-5} + \frac{1}{x+5} = \frac{15}{3x-5} + \frac{3}{3x-5}$$

$$\text{Or, } \frac{10}{2x-5} - \frac{15}{3x-5} = \frac{3}{3x-5} - \frac{1}{x+5}$$

$$\begin{aligned}\text{Or, } \frac{10(3x-5)-15(2x-5)}{(2x-5)(3x-5)} &= \frac{3(x+5)-1(3x-5)}{(3x-5)(x+5)} \\ \text{Or, } \frac{30x-50-30x+75}{(2x-5)} &= \frac{3x+15-3x+5}{(x+5)} \quad [\text{Multiplying both sides by } (3x-5)] \\ \text{Or, } \frac{25}{(2x-5)} &= \frac{20}{(x+5)} \\ \text{Or, } \frac{5}{(2x-5)} &= \frac{4}{(x+5)} \quad [\text{Dividing both sides by } 5] \\ \text{Or, } 4(2x-5) &= 5(x+5) \\ \text{Or, } 8x - 20 &= 5x + 25 \\ \text{Or, } 8x - 5x &= 25 + 20 \\ \text{Or, } 3x &= 45 \\ \therefore x &= 15.\end{aligned}$$

Shahjalal Islami Bank Ltd.

Trainee Senior Officer 2018 [Exam Taker: BIBM]

1. A team of 2 men and 5 women completed $\frac{1}{4}^{\text{th}}$ of a job in 3 days. After 3 days, another man joined the team and they took 2 days to complete another $\frac{1}{4}^{\text{th}}$ of the job. How many men can complete the remaining job in 4 days?

Solution:

Let, Men=M, Women=W

$$\begin{aligned}2M \text{ \& } 5W \text{ complete in 3 days} &= \frac{1}{4} \text{ part of the job} \\ \therefore \text{ " " " " " " " 1 day} &= \frac{1}{4 \times 3} \text{ " " " " } \\ &= \frac{1}{12} \text{ " " " " }\end{aligned}$$

After joining 1 men,

$$\begin{aligned}3M \text{ \& } 5W \text{ complete in 2 days} &= \frac{1}{4} \text{ part of the job} \\ \therefore \text{ " " " " " " " 1 day} &= \frac{1}{4 \times 2} \text{ " " " " } \\ &= \frac{1}{8} \text{ " " " " }\end{aligned}$$

$$\begin{aligned}\therefore 1 \text{ man can complete in 1 day} &= \left(\frac{1}{8} - \frac{1}{12} \right) \text{ part of the job} \\ &= \frac{1}{24} \text{ " " " " }\end{aligned}$$

$$\text{Remaining} = \left(1 - \frac{1}{4} - \frac{1}{4} \right) = \frac{1}{2} \text{ part of the job}$$

In 1 day $\frac{1}{24}$ part of the job can complete by 1 man

In 1 day 1 part of the job can complete by 24 men

In 4 day $\frac{1}{2}$ part of the job can complete by $\frac{24}{4 \times 2}$ men
= 3 men

Ans: 3 men.

Alternative method:

Let, Men=M, Women=W

(2M+5W) can do $\frac{1}{4}$ of a job in 3 days

(2M+5W) can do 1 job in $3 \times 4 = 12$ days

So, in 1 day (2M+5W) can do $\frac{1}{12}$ of a job

Similarly, in 1 day (3M+5W) can do $\frac{1}{8}$ of a job

So 1 man can do in 1 day $= (\frac{1}{8} - \frac{1}{12}) = \frac{1}{24}$ of the job

\therefore 1 man can do in 4 days $\frac{1 \times 4}{24} = \frac{1}{6}$ of the job

$\frac{1}{6}$ part of the job can be done in 4 days by 1 man

\therefore 1 part of the job can be done in 4 days by 6 men

$\therefore \frac{1}{2}$ part of the job can be done in 4 days by $\frac{6}{2}$ men
 $= 3$ men

Ans: 3 men.

2. Mr. Rahman invests Tk. 2400 at 5% interest annually. How much additional money needs to invest at 8% interest to earn overall interest at 6% on entire amount? (UCBL Officer 2011)

Solution:

Let, additional amount be Tk. p

According to the question,

5% of 24,00 + 8% of x = 6% of (24,00 + x)

Or, $\frac{5}{100} \times 24,000 + \frac{8}{100} \times x = \frac{6}{100} \times (24,000 + x)$

Or, $5 \times 24,00 + 8x = 6(24,00 + x)$ [Multiplying by 100]

Or, $120,00 + 8x = 14400 + 6x$

Or, $8x - 6x = 14400 - 120,00$

Or, $2x = 2400$

Or, $x = 2400/2$

$\therefore x = 1200$

\therefore Additional amount = Tk. 1200. (**Ans.**)

Alternative Method:

Let, the total amount be Tk. x.

So, additional amount = Tk. (x-2400)

According to the question,

8% of (x-2400) + 5% of 2400 = 6% of x

Or, $\frac{8(x-24,00)}{100} + \frac{5 \times 2400}{100} = \frac{6x}{100}$

Or, $8(x-2400) + 5 \times 2400 = 6x$

Or, $8x - 19200 + 12000 = 6x$

Or, $8x - 6x = 19200 - 12000$

Or, $2x = 7200$

Or, $x = 7200/2$

$\therefore x = 3600$

\therefore Additional amount = Tk. (3600-2400) = Tk. 1200 (**Ans.**)

3. A garden is 60 meter long and 20 meter wide. Inside the garden there is a 5 meter wide path around it. How much would it cost to cover the path with grass at the rate of Tk. 20 per square? (Premier Bank TJO 18)

Solution:

Area of the garden with path = (60×20) sq. m.
= 1200 sq. m.

Area of the garden without path = $(60-5-5) \times (20-5-5)$ sq. m.
= 50×10 sq. m.
= 500 sq. m.

\therefore Area of the path = $(1200-500)$ sq. m. = 700 sq. m.

\therefore Total cost to cover the path with grass at rate of Tk. 20 per square feet
= Tk. (700×20)
= Tk. 14,000 (Ans.)

4. $\frac{10}{2x-5} + \frac{1}{x+5} = \frac{18}{3x-5}$ (SJBL MTO 16)

Solution:

$$\frac{10}{2x-5} + \frac{1}{x+5} = \frac{18}{3x-5}$$

$$\text{Or, } \frac{10}{2x-5} + \frac{1}{x+5} = \frac{15+3}{3x-5}$$

$$\text{Or, } \frac{10}{2x-5} + \frac{1}{x+5} = \frac{15}{3x-5} + \frac{3}{3x-5}$$

$$\text{Or, } \frac{10}{2x-5} - \frac{15}{3x-5} = \frac{3}{3x-5} - \frac{1}{x+5}$$

$$\text{Or, } \frac{10(3x-5) - 15(2x-5)}{(2x-5)(3x-5)} = \frac{3(x+5) - 1(3x-5)}{(3x-5)(x+5)}$$

$$\text{Or, } \frac{30x-50-30x+75}{(2x-5)} = \frac{3x+15-3x+5}{(x+5)} \quad [\text{Multiplying both sides by } (3x-5)]$$

$$\text{Or, } \frac{25}{(2x-5)} = \frac{20}{(x+5)}$$

$$\text{Or, } \frac{5}{(2x-5)} = \frac{4}{(x+5)} \quad [\text{Dividing both sides by 5}]$$

$$\text{Or, } 4(2x-5) = 5(x+5)$$

$$\text{Or, } 8x - 20 = 5x + 25$$

$$\text{Or, } 8x - 5x = 25 + 20$$

$$\text{Or, } 3x = 45$$

$$\therefore x = 15.$$

Ans: $x = 15$

Special Cadre Officer 2018 [Exam Taker: BIBM]

1. In 2017, the number of product that a company sold to retailers decreased by 20%, while the price per unit increased by 20% from that of previous year. Company's revenue from the sales of the product in 2017 was Tk. 6,00,000. Find out the difference between the sales revenue of the year 2017 and 2016.

Solution:

Let, in 2016 the company sold the number of products be 100 units at the rate of Tk.100x per unit.

In 2016, Total revenue = Tk. (100×100x) = Tk.10000x

In 2017,

The number of products = 80% of 100 = 80 units.

Price per unit = 120% of 100x = Tk. 120x

Total revenue = Tk. (80×120x) = Tk. 9600x

Total revenue decreased = Tk. (10000x- 9600x) = Tk. 400x

According to the question,

9600x = 6.00.000

Or, 400x = $\frac{600000 \times 400}{9600}$

∴ 400x = 25000

∴ The difference of sales revenue = Tk. 25,000. (Ans.)

2. 2 men and 5 women completed $\frac{1}{4}$ th of a job in 3 days. After that another man joined them and they all complete the next $\frac{1}{4}$ th of the job in 2 days. How many men (with no women) can complete the whole job in 4 days? (BB AD 14, PKSf Asst. Manager 09, NCC Bank Officer 02)

Solution:

Suppose Men=M, Women=W

2M & 5W complete in 3 days = $\frac{1}{4}$ part of the job

∴ " " " " " " " 1 day = $\frac{1}{4 \times 3}$ " " "
= $\frac{1}{12}$ " " "

After joining 1 men,

3M & 5W complete in 2 days = $\frac{1}{4}$ part of the job

∴ " " " " " " " 1 day = $\frac{1}{4 \times 2}$ " " "
= $\frac{1}{8}$ " " "

∴ 1 man can complete in 1 day = $(\frac{1}{8} - \frac{1}{12})$ part of the job
= $\frac{1}{24}$ " " "

1 man does $\frac{1}{24}$ parts of the job in 1 day

∴ 1 man does 1 (whole) " " " = $\frac{1 \times 24}{1 \times 1} = 24$ days

In 24 days the job completed by 1 man
 In 1 " " " " " " " " 1×24 "
 $\therefore 4$ " " " " " " " " $\frac{24}{4}$ "
 $= 6$ men

Ans: 6 men.

Alternative method:

Suppose Men=M, Women=W

(2M+5W) can do $\frac{1}{4}$ of a job in 3 days

(2M+5W) can do 1 job in $3 \times 4 = 12$ days

So, in 1 day (2M+5W) can do $\frac{1}{12}$ of a job

Similarly, in 1 day (3M+5W) can do $\frac{1}{8}$ of a job

So 1 man can do in 1 day $= (\frac{1}{8} - \frac{1}{12}) = \frac{1}{24}$ of the job

\therefore 1man can do in 4 days $\frac{1 \times 4}{24} = \frac{1}{6}$ of the job

now, $\frac{1}{6}$ of the job can be done in 4 days by 1 Men

so, 1(whole) job can be done in 4 days by 6 Men

Ans: 6 men.

3. A sum of money is to be distributed equally among a group of children. If there were 25 children less than each would get Tk. 1.50 more, and if there 50 children more, each would get TK. 1.50 less. Find the number of children and the amount of money distributed. (National Bank PO 15)

Solution:

Let, amount be Tk. x and number of children be y.

So, per head amount = Tk. $\frac{x}{y}$

According to the question,

$$\frac{x}{y-25} - \frac{x}{y} = 1.50 \quad \dots\dots(i)$$

$$\frac{x}{y} - \frac{x}{y+50} = 1.50 \quad \dots\dots(ii)$$

From equation (i) and (ii) we get

$$\frac{x}{y-25} - \frac{x}{y} = \frac{x}{y} - \frac{x}{y+50}$$

$$\text{Or, } \frac{xy - xy + 25x}{y(y-25)} = \frac{xy + 50x - xy}{y(y+50)}$$

$$\text{Or, } \frac{25x}{y(y-25)} = \frac{50x}{y(y+50)}$$

$$\text{Or, } \frac{25x}{(y-25)} = \frac{50x}{(y+50)} \quad [\text{Multiplying both sides by 'y'}]$$

$$\text{Or, } \frac{1}{(y-25)} = \frac{2}{(y+50)} \quad [\text{Dividing both sides by } 25x]$$

$$\text{Or, } 2y - 50 = y + 50 \quad [\text{Cross multiplication}]$$

$$\text{Or. } 2y - y = 50 + 50$$

$$\therefore y = 100$$

Putting the value of y in equation (i) we get,

$$\frac{x}{100-25} - \frac{x}{100} = 1.50$$

$$\text{Or, } \frac{x}{75} - \frac{x}{100} = 1.50$$

$$\text{Or, } \frac{4x-3x}{300} = 1.50$$

$$\text{Or, } \frac{x}{300} = 1.50$$

$$\therefore x = 450$$

So, the number of children = 100 and the amount of money = Tk. 450

Ans: 100 children and Tk. 450.

Alternative Method:

Let, total number of children be 'x' and money distributed to child 'y'

So, total amount of money = xy

According to the question,

$$xy = (x-25)(y+1.50)$$

$$\text{Or, } xy = xy - 25y - 37.5 + 1.5x$$

$$\therefore 25y + 37.5 = 1.5x \dots\dots(i)$$

Again,

$$xy = (x+50)(y-1.50)$$

$$\text{Or, } xy = xy + 50y - 75 - 1.5x$$

$$\therefore 1.5x = 50y - 75 \dots\dots(ii)$$

From equation (i) and (ii) we get,

$$50y - 75 = 25y + 37.5$$

$$\text{Or, } 50y - 25y = 37.5 + 75$$

$$\text{Or, } 25y = 112.5$$

$$\therefore y = 4.5$$

Now, putting the value of y in equation (ii)

$$1.5x = 50 \times 4.5 - 75$$

$$\text{Or, } 1.5x = 225 - 75$$

$$\text{Or, } 1.5x = 150$$

$$\therefore x = 100$$

So, the number of children = 100

and the amount of money = Tk. $(4.5 \times 100) = \text{Tk. } 450$

Ans: 100 children and Tk. 450.

$$4. \frac{x+3}{x+2} - \frac{x+4}{x+3} = \frac{x+5}{x+4} - \frac{x+6}{x+5}$$

$$\text{Or, } \frac{x+2+1}{x+2} - \frac{x+3+1}{x+3} = \frac{x+4+1}{x+4} - \frac{x+5+1}{x+5}$$

$$\text{Or, } 1 + \frac{1}{x+2} - 1 - \frac{1}{x+3} = 1 + \frac{1}{x+4} - 1 - \frac{1}{x+5}$$

$$\text{Or, } \frac{1}{x+2} - \frac{1}{x+3} = \frac{1}{x+4} - \frac{1}{x+5}$$

$$\text{Or, } \frac{x+3-x-2}{(x+2)(x+3)} = \frac{x+5-x-4}{(x+4)(x+5)}$$

$$\text{Or, } \frac{1}{(x+2)(x+3)} = \frac{1}{(x+4)(x+5)}$$

$$\text{Or, } (x+4)(x+5) = (x+2)(x+3)$$

$$\text{Or, } x^2 + 4x + 5x + 20 = x^2 + 2x + 3x + 6$$

$$\text{Or, } x^2 + 9x + 20 = x^2 + 5x + 6$$

$$\text{Or, } x^2 + 9x - x^2 - 5x = 6 - 20$$

$$\text{Or, } 4x = -14$$

$$\text{Or, } x = \frac{-14}{4}$$

$$\therefore x = \frac{-7}{2}$$

$$\text{Ans: } x = \frac{-7}{2}$$

Standard Bank Ltd

Trainee Assistant Officer 2018 [Exam Taker: BIBM]

1. In a mixture 60 litres, the ratio of milk and water 2 : 1. If this ratio is to be 1: 2, then estimate the quantity of water in litre to be further added in the mixture.

Solution:

$$\text{Milk} = \frac{2}{3} \times 60 = 40 \text{ Liters}$$

$$\text{Water} = \frac{1}{3} \times 60 = 20 \text{ Liters}$$

Let, water added be x liters

According to the question,

$$\frac{40}{20+x} = \frac{1}{2}$$

$$\text{Or, } 20 + x = 80$$

$$\text{Or, } x = 80 - 20$$

$$\therefore x = 60.$$

\therefore 60 liters of water further added in the mixture. (Ans.)

2. If $x = 3 + 2\sqrt{2}$, then the value of $\sqrt{x} - \frac{1}{\sqrt{x}}$

Solution:

প্রশ্নে ভুল আছে, $x = 3 + 2\sqrt{2}$ হবে।

Given that, $x = 3 + 2\sqrt{2}$

$$\therefore \frac{1}{x} = \frac{1}{3+2\sqrt{2}}$$

$$= \frac{1 \times (3-2\sqrt{2})}{(3+2\sqrt{2})(3-2\sqrt{2})}$$

$$= \frac{(3-2\sqrt{2})}{3^2 - (2\sqrt{2})^2}$$

$$= \frac{(3-2\sqrt{2})}{9-8}$$

$$\therefore \frac{1}{x} = 3 - 2\sqrt{2}$$

$$\therefore x + \frac{1}{x} = 3 + 2\sqrt{2} + 3 - 2\sqrt{2} = 6$$

Now,

$$(\sqrt{x} - \frac{1}{\sqrt{x}})^2 = x + \frac{1}{x} - 2 = 6 - 2 = 4$$

$$\therefore \sqrt{x} - \frac{1}{\sqrt{x}} = 2. (\text{Ans.})$$

Trainee Assistant Officer (Cash) 2018 [Exam Taker: BIBM]

1. A merchant purchased a jacket for Tk. 60 and then determined a selling price that equaled the purchase price of the jacket plus a markup that was 25 percent of the selling price. During a sale, the merchant discounted the selling price by 20 percent and sold the jacket. What was the merchant's gross profit on this sale?

Solution:

Let, determined selling price be Tk. x

According to the question,

$$x = 60 + 25\% \text{ of } x$$

$$\text{Or, } x = 60 + 0.25x$$

$$\text{Or, } x - 0.25x = 60$$

$$\text{Or, } 0.75x = 60$$

$$\therefore x = 80$$

$$\therefore \text{Determined selling price} = \text{Tk. } 80$$

At 20% discount,

$$\text{selling price} = 80\% \text{ of Tk. } 80 = \text{Tk. } 64.$$

$$\therefore \text{Gross profit} = \text{Tk. } (64 - 60) = \text{Tk. } 4 \text{ (Ans.)}$$

2. Selling 12 candies are sold for Tk. 10 then there is a loss of $x\%$. If 12 candies are sold for Tk. 12 then there is a profit of $x\%$. What is the value of x ? (South East Bank PO 17)

Solution:

Let, cost price be Tk. 100.

$$\therefore \text{At } x\% \text{ loss, selling price} = \text{Tk. } (100 - x)$$

If selling price Tk. $(100 - x)$ then cost price Tk. 100

$$\text{If selling price Tk. } 10 \text{ then cost price Tk. } \frac{100 \times 10}{100 - x}$$

Similarly, at $x\%$ profit

$$\text{Selling price} = \text{Tk. } (100 + x)$$

If selling price Tk. $(100 + x)$ then cost price Tk. 100

$$\text{If selling price Tk. } 12 \text{ then cost price Tk. } \frac{100 \times 12}{100 + x}$$

According to the question,

$$\frac{100 \times 10}{100 - x} = \frac{100 \times 12}{100 + x}$$

$$\text{Or, } \frac{5}{100 - x} = \frac{6}{100 + x} \text{ [Dividing both sides by 200]}$$

$$\text{Or, } 5(100 + x) = 6(100 - x)$$

$$\text{Or, } 500 + 5x = 600 - 6x$$

$$\text{Or, } 5x + 6x = 600 - 500$$

$$\text{Or, } 11x = 100$$

$$\therefore x = 9.09$$

$$\therefore \text{The value of } x = 9.09 \text{ (Ans.)}$$

Trainee Officer 2018 [Exam Taker:]

1. The percentage profit earned by selling an article for Tk. 1920 is equal to the percentage loss incurred by selling the same article for Tk 1280. At what price should the article be sold to make 25% profit? (South East Bank MTO 13, BB AD(ff) 15, Shahjalal Islami Bank MTO 13)

Solution:

Let, cost price be Tk. x

According to the question,

$$SP_1 - CP = CP - SP_2$$

$$1920 - x = x - 1280$$

$$\text{Or, } 1920 + 1280 = x + x$$

$$\text{Or, } 2x = 3200$$

$$\text{Or, } x = 3200/2$$

$$\therefore x = 1600$$

\therefore Cost price is Tk. 1600

\therefore At 25% profit,

New selling price = Tk. (1600 + 25% of 1600) = Tk. 2000

Ans: Tk. 2000.

Alternative Method:

Let, profit and loss both be Tk. x

According to the question,

$$SP_1 - \text{Profit} = SP_2 + \text{Loss}$$

$$1920 - x = 1280 + x$$

$$\text{Or, } 2x = 640$$

$$\therefore x = 320$$

\therefore Cost price = Selling price – profit

$$= \text{Tk. } (1920 - 320)$$

$$= \text{Tk. } 1600$$

\therefore At 25% profit,

New selling price = Tk. (1600 + 25% of 1600) = Tk. 2000

Ans: Tk. 2000

Alternative Method:

Let, amount of cost price be Tk. x

$$\text{Profit percentage} = \frac{SP - CP}{CP} \times 100\% = \frac{1920 - x}{x} \times 100\%$$

$$\text{Loss percentage} = \frac{CP - SP}{CP} \times 100\% = \frac{x - 1280}{x} \times 100\%$$

According to the question,

$$\frac{1920 - x}{x} \times 100\% = \frac{x - 1280}{x} \times 100\%$$

$$\text{Or, } 1920 - x = x - 1280$$

$$\text{Or, } 2x = 3200$$

$$\text{Or, } x = 3200/2$$

$$\therefore x = 1600$$

∴ At 25% profit,

New selling price = Tk. (1600+25% of 1600) = Tk. 2000

Ans: Tk. 2000

Alternative Method:

Let, profit and loss both be x %.

$$\frac{1920}{(100 + x)} = \frac{1280}{(100 - x)}$$

$$\text{Or, } 128,000 + 1280x = 192,000 - 1920x$$

$$\text{Or, } 1280x + 1920x = 192,000 - 128,000$$

$$\text{Or, } 3200x = 64,000$$

$$\therefore x = 20$$

$$\text{Cost price} = \text{Tk. } \frac{1920}{100+20} = \text{Tk. } 1600$$

∴ At 25% profit,

Selling Price = Tk. (1600+25% of 1600) = Tk. 2000

Ans: Tk. 2000

2. What will be the deposited amount at initial stage, if it becomes to Tk. 33,500 at the end of 5 years with a simple interest rate 13.5% per annum. How many years it will take to become Tk. 40,600 of the said deposited.[SEBL TO 2018]

Solution:

Here, Principal and Profit, A = Tk. 33,500, Time, n = 5 years, Rate of interest, r = 13.5%

Let, Principal = Tk. P

We know,

$$A = P(1 + rn)$$

$$\text{Or, } 33,500 = P(1 + 5 \times \frac{13.5}{100})$$

$$\text{Or, } 33,500 = P(1 + 0.675)$$

$$\text{Or, } 33,500 = 1.675P$$

$$\text{Or, } P = \frac{33500}{1.675}$$

$$\therefore P = 20,000$$

$$\therefore \text{Principal} = \text{Tk. } 20,000$$

Again,

$$A = P(1 + r n)$$

$$\text{Or, } 40,600 = 20,000(1 + n \times \frac{13.5}{100})$$

$$\text{Or, } \frac{40600}{20000} = 1 + 0.135n$$

$$\text{Or, } \frac{203}{100} - 1 = 0.135n$$

$$\text{Or, } \frac{203-100}{100} = 0.135n$$

$$\text{Or, } \frac{135n}{1000} = \frac{103}{100}$$

$$\text{Or, } n = \frac{103}{100} \times \frac{1000}{135} = \frac{206}{27}$$

$$\therefore n = 7 \frac{17}{27} \text{ Or, } 7.63$$

Ans: $7 \frac{17}{27}$ years. Or, 7.63 years.

Probationary Officer 2018 [Exam Taker: BIBM]

1. Mr. B invests Tk. 2400 at 5% interest annually. How much additional money needs to invest at 8% interest to earn overall interest at 6% on entire amount? (UCBL Officer 11)

Solution:

Let, additional amount be Tk. p

According to the question,

$$5\% \text{ of } 24,00 + 8\% \text{ of } x = 6\% \text{ of } (24,00 + x)$$

$$\text{Or, } \frac{5}{100} \times 24,000 + \frac{8}{100} \times x = \frac{6}{100} \times (24,000 + x)$$

$$\text{Or, } 5 \times 24,00 + 8x = 6(24,00 + x) \text{ [Multiplying by 100]}$$

$$\text{Or, } 120,00 + 8x = 14400 + 6x$$

$$\text{Or, } 8x - 6x = 14400 - 120,00$$

$$\text{Or, } 2x = 2400$$

$$\text{Or, } x = 2400/2$$

$$\therefore x = 1200$$

$$\therefore \text{Additional amount} = \text{Tk. } 1200. \text{ (Ans.)}$$

Alternative Method:

Let, the total amount be Tk. x.

So, additional amount = Tk. (x-2400)

According to the question,

$$8\% \text{ of } (x-2400) + 5\% \text{ of } 2400 = 6\% \text{ of } x$$

$$\text{Or, } \frac{8(x-24,00)}{100} + \frac{5 \times 2400}{100} = \frac{6x}{100}$$

$$\text{Or, } 8(x-2400) + 5 \times 2400 = 6x$$

$$\text{Or, } 8x - 19200 + 12000 = 6x$$

$$\text{Or, } 8x - 6x = 19200 - 12000$$

$$\text{Or, } 2x = 7200$$

$$\text{Or, } x = 7200/2$$

$$\therefore x = 3600$$

$$\therefore \text{Additional amount} = \text{Tk. } (3600 - 2400) = \text{Tk. } 1200 \text{ (Ans.)}$$

2. The perimeter of a square field is equal to the perimeter of a rectangle field. The length of the rectangle is thrice the width of it and the area is 768 square meters. How many square sized tiles of 80 centimeters will be required to cover the square field? (Al-Arafah Bank MTO-16)

Solution:

Let, the width of rectangle field be x meters.

So, length = 3x meters.

According to the question,

$$3x \times x = 768$$

$$\text{Or, } 3x^2 = 768$$

$$\text{Or, } x^2 = 256$$

$$\therefore x = 16$$

$$\therefore \text{Width} = 16 \text{ meters and length} = 3 \times 16 = 48 \text{ meters.}$$

$$\therefore \text{Perimeter of the rectangle field} = 2(48 + 16) = 128 \text{ meters.}$$

So, perimeter of the square field = 128 meters.

∴ One side of the square = $128/4 = 32$ meters.

∴ Area of the square = $(32)^2 = 1024$ sq. meters.

Given that, one side of the tiles = 80 centimeters = 0.8 meters.

∴ Area of the tiles = $0.8 \times 0.8 = 0.64$ sq meters.

∴ Required number of tiles = $1024 / 0.64 = 1600$.

Ans: 1600

3. A salesman is paid a monthly salary of Tk. 15,000 plus 12.5% commission on all his sales. What should be his annual sales in Taka so that his annual earnings from salary and commission is Tk. 265000?

Solution:

Let, annual sales be Tk. x

According to the question,

$$15,000 \times 12 + 12.5\% \text{ of } x = 265000$$

$$\text{Or, } 180,000 + 0.125x = 265,000$$

$$\text{Or, } 0.125x = 265,000 - 180,000$$

$$\text{Or, } 0.125x = 85,000$$

$$\text{Or, } x = \frac{85000}{0.125}$$

$$\therefore x = 680,000$$

$$\therefore \text{Annual sales} = \text{Tk. } 680,000$$

4. Solve the equation: $\frac{4}{2x+1} + \frac{9}{3x+2} = \frac{25}{5x+4}$ [Al-Arafah Bank MTO 16]

Solution:

$$\frac{4}{2x+1} + \frac{9}{3x+2} = \frac{25}{5x+4}$$

$$\text{Or, } \frac{4}{2x+1} + \frac{9}{3x+2} = \frac{10}{5x+4} + \frac{15}{5x+4}$$

$$\text{Or, } \frac{4}{2x+1} - \frac{10}{5x+4} = \frac{15}{5x+4} - \frac{9}{3x+2}$$

$$\text{Or, } \frac{20x+16-20x-10}{(5x+4)(2x+1)} = \frac{45x+30-45x-36}{(5x+4)(3x+2)}$$

$$\text{Or, } \frac{6}{2x+1} = \frac{-6}{3x+2} \quad [\text{Multiplying both sides by } (5x+4)]$$

$$\text{Or, } \frac{1}{2x+1} = \frac{-1}{3x+2} \quad [\text{Dividing both sides by } 6]$$

$$\text{Or, } 3x + 2 = -2x - 1$$

$$\text{Or, } 3x + 2x = -1 - 2$$

$$\text{Or, } 5x = -3$$

$$\therefore x = \frac{-3}{5} \quad (\text{Solved})$$

Dutch Bangla Bank Ltd.

Probationary Officer 2018 [Exam Taker: IBA, DU]

1. In a school there are 10 classes and each class consists of equal no. of students. On a day the weather was not good and in 3 classes half of the class was full, in 5 classes $\frac{3}{4}$ full and in 2 classes $\frac{1}{6}$ empty. Total 74 students were absent that day. What is the total no. of students?

Solution:

Let, number of students in each class be x .

\therefore Total students = $10x$.

Number of students absent in each,

1st 3 classes = $\frac{1}{2}$ of $x = \frac{x}{2}$

2nd 5 classes = $(1 - \frac{3}{4})$ of $x = \frac{x}{4}$

last 2 classes = $\frac{1}{6}$ of $x = \frac{x}{6}$

According to the question,

$$3 \times \frac{x}{2} + 5 \times \frac{x}{4} + 2 \times \frac{x}{6} = 74$$

$$\text{Or, } \frac{3x}{2} + \frac{5x}{4} + \frac{x}{3} = 74$$

$$\text{Or, } \frac{18x + 15x + 4x}{12} = 74$$

$$\text{Or, } \frac{37x}{12} = 74$$

$$\text{Or, } x = 74 \times \frac{12}{37}$$

$$\therefore x = 24$$

$$\therefore \text{Total students} = 10 \times 24 = 240. \text{ (Ans.)}$$

Alternative Method:

Let, number of students in each class be $12x$.

\therefore Total students = $10 \times 12x = 120x$.

Number of students absent in,

1st 3 classes = $3 \times (\frac{1}{2} \text{ of } 12x) = 18x$

2nd 5 classes = $5 \times \{(1 - \frac{3}{4}) \text{ of } 12x\} = 15x$

last 2 classes = $2 \times (\frac{1}{6} \text{ of } 12x) = 4x$

According to the question,

$$18x + 15x + 4x = 74$$

$$\text{Or, } 37x = 74$$

$$\text{Or, } x = \frac{74}{37}$$

$$\therefore x = 2$$

$$\therefore \text{Total students} = 120 \times 2 = 240. \text{ (Ans.)}$$

2. Certain amount of money was taken for 4 years on simple interest. First two years interest rate was 5% and on 3rd and 4th year interest rate was 4%. After 4 years sum of profit and principle became 1416. What was the principle amount? (DBBL PO 18)

Solution:

Let, Principal amount be Tk. P

Given that,

after 4 years total amount = Tk. 1416

Here, Interest = Total amount – Principal = 1416 – P

We know,

Interest = Principal × Time × Rate of interest

According to the question,

$$P \times 2 \times 5\% + P \times 2 \times 4\% = 1416 - P$$

$$\text{Or, } P \times 2 \times \frac{5}{100} + P \times 2 \times \frac{4}{100} = 1416 - P$$

$$\text{Or, } 10P + 8P = 141600 - 100P \text{ [Multiplying both sides by 100]}$$

$$\text{Or, } 18P + 100P = 141600$$

$$\text{Or, } 118P = 141600$$

$$\therefore P = 1200$$

$$\therefore \text{Principal amount} = \text{Tk. 1200 (Ans.)}$$

National Credit and Commerce Bank Ltd.

Management Trainee Officer 2018 [Exam Taker: IBA, DU]

1. The difference between simple & compound interest annually on same amount at 8% for 2 years is Taka 12.80, what is the principal amount?

Solution:

Let, Principal amount = Tk. P

At 8% interest in 2 years,

$$\text{Simple Interest} = \text{Tk. } (P \times 8\% \times 2) = \text{Tk. } 0.16P$$

At 8% interest in 2 years,

$$\text{Compound Interest} = \text{Tk. } \{P(1+8\%)^2 - P\} = \text{Tk. } 0.1664P$$

According to the question,

$$0.1664P - 0.16P = 12.80$$

$$\text{Or, } 0.0064P = 12.80$$

$$\therefore P = 2000$$

$$\therefore \text{Principal amount} = \text{Tk. 2000. (Ans.)}$$

2. Jaya can make 40 pancakes in a minute. Sally can make pancakes at half of Jaya's rate. What time will it need (in minute) to make 150 cakes, if Sally have already made a start of 30 pancakes alone?

Solution:

Given that,

Jaya can make 40 pancakes in a minute.

Sally can make pancakes at half of Jaya's rate.

So, Sally can make $40/2 = 20$ pancakes in a minute.

20 pancakes can make in 1 min

30 pancakes can make in $\frac{30}{20} = 1.5$ min

Remaining = $150 - 30 = 120$ pancakes.

In 1 min Jaya and Sally together can make = $40 + 20 = 60$ pancakes

They together can make 60 pancakes in 1 min

They together can make 120 pancakes in $\frac{120}{60}$ min = 2 min

Total required time = $(1.5 + 2)$ min = 3.5 min (**Ans.**)

<i>IFIC Bank Ltd.</i>

Trainee Senior Officer 2018 [Exam Taker:]

1. If the tax rate of Tea leaves by 10% reduction. Then how the uses of Tea leaves should increase to get 8% more tax by the government? (IFIC TSO 18)

Solution:

Let, previous tax rate be Tk. $100x$

At % reduction, new tax rate = 90% of Tk. $100x = \text{Tk. } 90x$

To get 10% more than previous, tax will be = 108% of Tk. $100x = \text{Tk. } 108x$

\therefore Need to increase of uses = Tk. $(108 - 90) = \text{Tk. } 18$

\therefore Percentage of increasing uses = $\frac{18}{90} \times 100\% = 20\%$

Ans: 20%

2. The average age of 6 men, 8 women and 1 boy is 35 years .If the average age of the men is 40 years and the average age of the women is 34 years. What is the age of the boy?[IFIC Bank-TSO-2018]

Solution:

The average age of 6 men, 8 women and 1 boy is 35 years

Total age of 6 men, 8 women and 1 boy = $(15 \times 35) = 525$ years

The average age of the men is 40 years

Total age of 6 men = (6×40) years = 240 years

The average age of the women is 34 years

Total age of 8 women = (8×34) years = 272 years

\therefore The age of 1 boy = $525 - 240 - 272 = 13$ years. (**Ans.**)

Assistant Officer (Cash) 2018 [Exam Taker: Social Science Faculty, DU]

1. Anik visited his cousin Rowhan during the summer vacation. In the mornings, they both would go for swimming. In the evenings, they would play tennis. They would engage in at most one activity per day, i.e. either they went swimming or played tennis each day. There were days when they took rest and stayed home all day long. There were 32 mornings when they did nothing, 18 evenings when they stayed at home, and a total of 28 days when they swam or played tennis. What duration of the summer vacation did Anik stay with Rowhan?

Solution:

Let, duration of the vacation be x days.

Given that,

32 morning did nothing, so went for swimming = $(x-32)$ days.

18 evening stayed at home, so played tennis = $(x-18)$ days.

A total of 28 days, they swam or played tennis.

According to the question,

$$(x-32) + (x-18) = 28$$

$$\text{Or, } 2x - 50 = 28$$

$$\text{Or, } 2x = 28 + 50$$

$$\text{Or, } 2x = 78$$

$$\therefore x = 39$$

$$\therefore \text{Duration of the vacation} = 39 \text{ days. (Ans.)}$$

2. In a three digit number the number in unit place is 75% of tenth digit number, the tenth digit number is greater than hundred digit by 1 & their sum will be 15, find out the number?

Solution:

Let, tenth digit be $4x$

So, unit digit = 75% of $4x = 3x$ and hundred digit = $4x - 1$

$$\begin{aligned}\therefore \text{The number} &= 100(4x-1) + 10 \times 4x + 3x \\ &= 400x - 100 + 40x + 3x \\ &= 443x - 100\end{aligned}$$

According to the question,

$$4x + 4x - 1 = 15$$

$$\text{Or, } 8x = 15 + 1$$

$$\text{Or, } 8x = 16$$

$$\therefore x = 2$$

$$\therefore \text{The number} = 443 \times 2 - 100 = 786 \text{ (Ans.)}$$

Probationary Officer 2018 [Exam Taker: Social Science Faculty, DU]

From a number of apples, a man sells half the number of existing apple plus 1 to the first customer, sells 1/3rd of the remaining apple plus 1 to the second consumer, and sells 1/5th of the remaining apple plus 1 to the third consumer. He then finds that he has 3 apples left. How many apples did he have originally?

Solution:

Let, the number of apples be x

$$\text{He sold to 1st customer} = \frac{x}{2} + 1 = \frac{x+2}{2}$$

$$\text{Remaining} = x - \frac{x+2}{2} = \frac{2x-x-2}{2} = \frac{x-2}{2}$$

$$\text{He sold to 2nd customer} = \left(\frac{1}{3} \text{ of } \frac{x-2}{2}\right) + 1 = \frac{x-2}{6} + 1 = \frac{x+4}{6}$$

$$\text{Remaining} = \frac{x-2}{2} - \frac{x+4}{6} = \frac{3x-6-x-4}{6} = \frac{2x-10}{6} = \frac{2(x-5)}{6} = \frac{x-5}{3}$$

$$\text{He sold to 3rd customer} = \left(\frac{1}{5} \text{ of } \frac{x-5}{3}\right) + 1 = \frac{x-5}{15} + 1 = \frac{x+10}{15}$$

$$\text{Remaining} = \frac{x-5}{3} - \frac{x+10}{15} = \frac{5x-25-x-10}{15} = \frac{4x-35}{15}$$

According to the question,

$$\frac{4x-35}{15} = 3$$

$$\text{Or, } 4x - 35 = 45$$

$$\text{Or, } 4x = 45 + 35$$

$$\text{Or, } 4x = 80$$

$$\therefore x = 20$$

$$\therefore \text{The number of apples} = 20.$$

2. A train starts from station A with some passengers. At station B, 10% of the passengers get down 100 passengers get in. At station C, 50% get down and 25 get in. At station D, 50% get down and 50 get in making the total number of passengers 200. How many passengers did board the train at station A?

Solution:

Let, total passengers at station A be $100x$.

$$\text{At station B, total passengers} = 90\% \text{ of } 100x + 100 = 90x + 100$$

$$\text{At station C, total passengers} = 50\% \text{ of } (90x+100) + 25$$

$$= 45x + 50 + 25$$

$$= 45x + 75$$

$$\text{At station D, total passengers} = 50\% \text{ of } (45x+75) + 50$$

$$= 22.5x + 37.5 + 50$$

$$= 22.5x + 87.5$$

According to the question,

$$22.5x + 87.5 = 200$$

$$\text{Or, } 22.5x = 200 - 87.5$$

$$\text{Or, } 22.5x = 112.5$$

$$\text{Or, } 100x = \frac{112.5 \times 100}{22.5}$$

$$\therefore 100x = 500$$

$$\therefore \text{Total passengers at station A} = 500. (\text{Ans.})$$

3. A farmer sold a Cow & Ox for Tk. 80,000 and got a profit on 20% on the Cow & 25% on the Ox. If he sells the cow and the ox for Tk. 82,000 and got a profit 25% on Cow and 20% on the Ox. Find the individual cost price of both?

Solution:

Let, price of a Cow be Tk. C and an Ox be Tk. O

1st Condition,

$$120\% \text{ of } C + 125\% \text{ of } O = 80,000$$

$$\text{Or, } \frac{120C}{100} + \frac{125O}{100} = 80,000$$

$$\text{Or, } \frac{6C}{5} + \frac{5O}{4} = 80,000$$

$$\therefore 24C + 25O = 16,00,000 \text{(i)} \quad [\text{Multiplying both sides by 20}]$$

2nd Condition,

$$125\% \text{ of } C + 120\% \text{ of } O = 82,000$$

$$\text{Or, } \frac{125C}{100} + \frac{120O}{100} = 82,000$$

$$\text{Or, } \frac{5C}{4} + \frac{6O}{5} = 82,000$$

$$\therefore 25C + 24O = 16,40,000 \text{(ii)} \quad [\text{Multiplying both sides by 20}]$$

Now, (ii)×25 – (i)×24 =>

$$625C - 576C = 41,00,000 - 38,400,000$$

$$\text{Or, } 49C = 26,00,000$$

$$\therefore C = 53061.22$$

Putting the value of C in equation (i)

$$24 \times 53061.22 + 25O = 16,00,000$$

$$\text{Or, } 1273469.39 + 25O = 16,00,000$$

$$\therefore O = 13061.22$$

Ans: C = 53061.22 and O = 13061.22

NRBC Bank Ltd.

Management Trainee Officer 2018 [Exam Taker: BIBM]

1. A, B and C can do a piece of work in 16, 32 and 48 days respectively. They started working together but C left after working 4 days and B left 2 days before the completion of work. How many days it took to complete the work? (Shahjalal Islami Bank MTO 11, Social Islami Bank PO 17)

Solution:

Let, the total work will be completed in x days.

In x days A's work = $\frac{x}{16}$ parts

Since left 2 days before the completion of work,

B work in (x-2) days = $\frac{x-2}{32}$ parts

And C works in 4 days = $4 \times \frac{1}{48} = \frac{1}{12}$ parts

According to the question,

$$\frac{x}{16} + \frac{x-2}{32} + \frac{1}{12} = 1$$

$$\text{Or, } \frac{2x+x-2}{32} = 1 - \frac{1}{12}$$

$$\text{Or, } \frac{3x-2}{32} = \frac{11}{12}$$

$$\text{Or, } 3x-2 = \left(\frac{11}{12}\right) \times 32$$

$$\text{Or, } 3x = \frac{88}{3} + 2 = \frac{94}{3}$$

$$\therefore x = 94/3 = 10\frac{4}{9}$$

So, the total work will be completed in $10\frac{4}{9}$ days

Ans: $10\frac{4}{9}$ days.

2. The perimeter of a square field is equal to the perimeter of a rectangle field. The length of the rectangle is thrice the width of it and the area is 768 square meters. How many square sized tiles of 80 centimeters will be required to cover the square field? (Al-Arafah Bank MTO-16)

Solution:

Let, the width of rectangle field be x meters.

So, length = 3x meters.

According to the question,

$$3x \times x = 768$$

$$\text{Or, } 3x^2 = 768$$

$$\text{Or, } x^2 = 256$$

$$\therefore x = 16$$

$$\therefore \text{Width} = 16 \text{ meters and length} = 3 \times 16 = 48 \text{ meters.}$$

$$\therefore \text{Perimeter of the rectangle field} = 2(48+16) = 128 \text{ meters.}$$

So, perimeter of the square field = 128 meters.

$$\therefore \text{One side of the square} = 128/4 = 32 \text{ meters.}$$

$$\therefore \text{Area of the square} = (32)^2 = 1024 \text{ sq. meters.}$$

Given that, one side of the tiles = 80 centimeters = 0.8 meters.

$$\therefore \text{Area of the tiles} = 0.8 \times 0.8 = 0.64 \text{ sq. meters.}$$

$$\therefore \text{Required number of tiles} = 1024 / 0.64 = 1600.$$

Ans: 1600

3. The cost price of two watches taken together is Tk. 840. If by selling one at a profit of 16% and the other at a loss of 12%, there is no loss or gain in the whole transaction, find the cost price of the two watches. (Shahajalal Bank MTO 11, Social Islami Bank PO 17)

Solution:

Let, 1st cost price = Tk. x and 2nd cost price = Tk. (840-x)

According to the question,

$$x \times 16\% = (840-x) \times 12\%$$

$$\text{Or, } 0.16x = 0.12(840-x)$$

$$\text{Or, } 0.16x = 100.8 - 0.12x$$

$$\text{Or, } 0.16x + 0.12x = 100.8$$

$$\text{Or, } 0.28x = 100.8$$

$$\text{Or, } x = 100.8 / 0.28$$

$$\therefore x = 360.$$

So, 1st cost price = Tk. 360 and 2nd cost price = Tk. (840-360) = Tk. 480.

Ans: Tk. 360 and Tk. 480.

4. Solve the equation: $\frac{8}{2x-1} + \frac{9}{3x-1} = \frac{7}{x+1}$

Solution:

$$\frac{8}{2x-1} + \frac{9}{3x-1} = \frac{7}{x+1}$$

$$\text{Or, } \frac{8}{2x-1} + \frac{9}{3x-1} = \frac{4}{x+1} + \frac{3}{x+1}$$

$$\text{Or, } \frac{8}{2x-1} - \frac{4}{x+1} = \frac{3}{x+1} - \frac{9}{3x-1}$$

$$\text{Or, } \frac{8x+8-8x+4}{(2x-1)(x+1)} = \frac{9x-3-9x-9}{(3x-1)(x+1)}$$

$$\text{Or, } \frac{12}{(2x-1)} = \frac{-12}{(3x-1)} \quad [\text{Multiplying by } (x+1)]$$

$$\text{Or, } \frac{1}{(2x-1)} = \frac{-1}{(3x-1)} \quad [\text{Dividing both sides by 12}]$$

$$\text{Or, } 3x-1 = -2x+1$$

$$\text{Or, } 3x + 2x = 1+1$$

$$\text{Or, } 5x = 2$$

$$\therefore x = \frac{2}{5}$$

End

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