Quick Mathematics MCQs

Age Problems MCQs

1. **Father is aged three times more than his son Ali. After 8 years, he would be two and a half times of Ali's age. After further 8 years, how many times would he be of Ali's age?**

   A. 2 times

   B. 2½ times

   C. 2¾ times

   D. 3 times

   Answer: A

   Solution:

   Let Ali's age = x. Father's age = 4x.

   After 8 years: $4x + 8 = 2.5(x + 8) \rightarrow x = 8$.

   After 16 years: Father = 48, Ali = 24 → Ratio = 2:1.

2. **The sum of ages of 5 children born at 3-year intervals is 50 years. What is the age of the youngest child?**

   A. 4 years

   B. 8 years

   C. 10 years

   D. None of these

   Answer: A

   Solution:

   Let youngest child's age = x.

   Ages: x, x+3, x+6, x+9, x+12.

   Sum: $5x + 30 = 50 \rightarrow x = 4$.

3. **A father (38 years now) said to his son, "I was as old as you are at your birth." The son's age 5 years back was:**

   A. 14 years

   B. 19 years

   C. 33 years

   D. 38 years

   Answer: A

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Solution:

Let son's age = x.

Father's age at son's birth = 38 - x = x → x = 19.

5 years ago: 19 - 5 = 14.

4. **A is 2 years older than B, who is twice as old as C. Total ages of A, B, and C is 27. How old is B?**

    A. 7

    B. 8

    C. 9

    D. 10

    Answer: D

    Solution:

    Let C's age = x. B's age = 2x. A's age = 2x + 2.

    Sum: 2x + 2 + 2x + x = 27 → x = 5.

    B's age = 2x = 10.

5. **Present ages of Sameer and Anand are in ratio 5:4. Three years later, the ratio becomes 11:9.**

    What is Anand's present age?

    A. 24

    B. 27

    C. 40

    D. Cannot be determined

    Answer: A

    Solution:

    Let Sameer's age = 5x, Anand's age = 4x.

    After 3 years: (5x + 3)/(4x + 3) = 11/9 → x = 6.

    Anand's age = 4x = 24.

6. **A man is 24 years older than his son. In 2 years, his age will be twice his son's age. The son's**

    present age is:

    A. 14 years

    B. 18 years

    C. 20 years

    D. 22 years

    Answer: D

    Solution:

Let son's age = x. Father's age = x + 24.

After 2 years: x + 26 = 2(x + 2) → x = 22.

7. **Six years ago, the ratio of Usman and Rauf's ages was 6:5. Four years later, it will be 11:10. Rauf's present age is:**

   A. 16 years

   B. 18 years

   C. 20 years

   D. Cannot be determined

   Answer: A

   Solution:

   6 years ago: Usman = 6x, Rauf = 5x.

   After 10 years: (6x + 10)/(5x + 10) = 11/10 → x = 2.

   Rauf's present age = 5x + 6 = 16.

8. **Sum of father and son's present ages is 60. Six years ago, father was 5 times as old as son. After 6 years, son's age will be:**

   A. 12 years

   B. 14 years

   C. 18 years

   D. 20 years

   Answer: D

   Solution:

   Let son's age = x. Father's age = 60 - x.

   6 years ago: 54 - x = 5(x - 6) → x = 14.

   After 6 years: 14 + 6 = 20.

9. **Fazal and Bilal's ages are in ratio 4:3. After 6 years, Fazal will be 26. Bilal's present age is:**

   A. 12 years

   B. 15 years

   C. 19.5 years

   D. 21 years

   Answer: B

   Solution:

   Fazal's age = 4x. After 6 years: 4x + 6 = 26 → x = 5.

   Bilal's age = 3x = 15.

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10. **Sohail is 7 years younger than Rizwan. Their ages are in ratio 7:9. Sohail's age is:**

A. 16 years

B. 18 years

C. 28 years

D. 24.5 years

Answer: D

Solution:

Let Rizwan's age = x. Sohail's age = x - 7.

(x - 7)/x = 7/9 → x = 31.5.

Sohail's age = 31.5 - 7 = 24.5.

Key Formulas for Age Problems:

If current age = x:

Age after *n* years = $x+n$.

Age before *n* years = $x-n$.

Age ratios:

If ratio is a:b, ages are ax and bx.

Difference in ages is constant over time.

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Speed, Time, and Distance MCQs

1. **A person crosses a 600 m street in 5 minutes. His speed in km/h is:**

   A. 3.6

   B. 7.2

   C. 8.4

   D. 10

   Solution:

   Speed = Distance/Time = 600m / 300s = 2 m/s.

   Convert to km/h: $2 \times (18/5) =$ **7.2 km/h**.

2. **An airplane covers 1200 km in 5 hours. To cover the same distance in 1⅔ hours, its speed must be:**

   A. 300 km/h

   B. 360 km/h

   C. 600 km/h

   D. 720 km/h

   Solution:

   Speed = Distance/Time = 1200 km / (5/3) hours = **720 km/h**.

3. **Walking at 14 km/h instead of 10 km/h, a person walks 20 km more. The actual distance traveled is:**

   A. 50 km

   B. 56 km

   C. 70 km

   D. 80 km

   Solution:

   Let actual distance = xx km.

   $x10 = x+201410x = 14x+20 \rightarrow x = 50x = 50$.

4. **A train is 50% faster than a car. Both travel 75 km, but the train stops for 12.5 minutes. The car's speed is:**

   A. 100 km/h

   B. 110 km/h

   C. 120 km/h

D. 130 km/h

Solution:

Let car's speed = xx km/h. Train's speed = $1.5x$$1.5x$.

Time difference: $75x - 751.5x = 12.560_{x}75 - 1.5x75 = 6012.5 \rightarrow x = 120x = 120$.

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5. **A bus's speed is 54 km/h excluding stoppages and 45 km/h including stoppages. Stoppage time per hour is:**

A. 9 min

B. 10 min

C. 12 min

D. 20 min

Solution:

Distance without stoppages = 54 km.

With stoppages, covers 45 km in 1 hour → Stoppage time = $954 \times 60 = 10549 \times 60 = 10$ min.

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6. **A 600 km flight's speed reduces by 200 km/h, increasing time by 30 minutes. Original flight duration was:**

A. 1 hour

B. 2 hours

C. 3 hours

D. 4 hours

Solution:

Let original time = xx hours.

$600x - 600x + 0.5 = 200_{x}600 - x + 0.5600 = 200 \rightarrow x = 1x = 1$.

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7. **A man travels half a journey at 21 km/h and the other half at 24 km/h, taking 10 hours total. Total distance is:**

A. 220 km

B. 224 km

C. 230 km

D. 234 km

Solution:

Let distance = xx km.

$x/221 + x/224 = 1021x/2 + 24x/2 = 10 \rightarrow x = 224x = 224$.

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8. **Two trains' speeds are in ratio 7:8. If the second train covers 400 km in 4 hours, the first train's speed is:**

A. 70 km/h

B. 75 km/h

C. 84 km/h

D. 87.5 km/h

Solution:

Second train's speed = 400 km / 4 h = 100 km/h.

First train's speed = $\frac{7}{8} \times 100 = 87.5$ km/h.

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9. **A man travels 160 km at 64 km/h and the next 160 km at 80 km/h. Average speed for 320 km is:**

A. 35.55 km/h

B. 36 km/h

C. 71.11 km/h

D. 71 km/h

Solution:

Total time = $\frac{160}{64} + \frac{160}{80} = 4.5$ h.

Average speed = 320 km / 4.5 h ≈ **71.11 km/h**.

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10. **A car covers 42 km at $\frac{57}{75}$ of its actual speed in 1 hour 40 min 48 sec. Actual speed is:**

A. $176\frac{7}{6}$ km/h

B. 25 km/h

C. 30 km/h

D. 35 km/h

Solution:

Time = $1 + \frac{40}{60} + \frac{48}{3600} = \frac{126}{75}$ h.

$\frac{57x \times 126}{75} = 42 \rightarrow x = 35$ km/h.

Key Formulas:

Speed (km/h) = Distance (km) / Time (h)

1 km/h = $\frac{5}{18}$ m/s

Average speed = Total Distance / Total Time

If speeds are a and b for equal distances, average speed = $\frac{2ab}{a+b}$.

AL HABIB ACADEMY
Average Problems MCQs

1. **In the first 10 overs of a cricket game, the run rate was 3.2. What should be the run rate in the remaining 40 overs to reach 282 runs?**

   A. 6.25

   B. 6.5

   C. 6.75

   D. 7

   Solution:

   Runs needed = 282 - (3.2 × 10) = 250.

   Required rate = 250 / 40 = **6.25 runs/over**.

   ___

2. **A family has 2 grandparents (avg. 67), 2 parents (avg. 35), and 3 grandchildren (avg. 6). The average age of the family is:**

   A. $28^4/_7$ years

   B. $31^5/_7$ years

   C. $32^1/_7$ years

   D. None

   Solution:

   Total age = (67×2) + (35×2) + (6×3) = 222.

   Average = 222 / 7 = **$31^5/_7$ years**.

   ___

3. **A grocer's sales for 5 months are Rs. 6435, 6927, 6855, 7230, and 6562. To average Rs. 6500 over 6 months, the 6th month's sale must be:**

   A. Rs. 4991

   B. Rs. 5991

   C. Rs. 6001

   D. Rs. 6991

   Solution:

   Total for 5 months = Rs. 34,009.

   Required sale = (6500 × 6) - 34,009 = **Rs. 4991**.

   ___

4. **The average of 20 numbers is zero. At most, how many numbers may be greater than zero?**

   A. 0

   B. 1

C. 10

D. 19

Solution:

If 19 numbers are positive, the 20th must be negative to balance the average to zero.

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5. **The average weight of 8 people increases by 2.5 kg when a new person replaces a 65 kg member. The new person's weight is:**

A. 76 kg

B. 76.5 kg

C. 85 kg

D. Data inadequate

Solution:

Total weight increase = $8 \times 2.5 = 20$ kg.

New person's weight = $65 + 20 = $ **85 kg**.

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6. **In a cricket team of 11, the captain (26) and wicketkeeper (29) are excluded. The average age of the remaining 9 players is 1 year less than the whole team's average. The team's average age is:**

A. 23 years

B. 24 years

C. 25 years

D. None

Solution:

Let average age = x.

$11x - 55 = 9(x-1) \rightarrow x = 23$.

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7. **The average monthly income of P & Q is Rs. 5050, Q & R is Rs. 6250, and P & R is Rs. 5200. P's income is:**

A. 3500

B. 4000

C. 4050

D. 5000

Solution:

$P+Q = 10,100$, $Q+R = 12,500$, $P+R = 10,400$.

Solving: $P = $ **Rs. 4000**.

8. **3 years ago, the average age of a husband, wife, and child was 27. 5 years ago, the wife and child's average age was 20. The husband's present age is:**

   A. 35

   B. 40

   C. 50

   D. None

   Solution:

   Present total age = $(27 \times 3) + (3 \times 3) = 90$.

   Wife + child's present age = $(20 \times 2) + (5 \times 2) = 50$.

   Husband's age = 90 - 50 = **40 years**.

9. **A car owner buys petrol at Rs. 7.50, 8, and 8.50 per litre for 3 successive years, spending Rs. 4000 annually. The approximate average cost per litre is:**

   A. Rs. 7.98

   B. Rs. 8

   C. Rs. 8.50

   D. Rs. 9

   Solution:

   Total petrol = $\frac{4000}{7.5} + \frac{4000}{8} + \frac{4000}{8.5} \approx 767$ litres.

   Average cost = $\frac{12000}{767} \approx **Rs. 7.98**$.

10. **Arun's weight is estimated by himself (65-72 kg), his brother (60-70 kg), and mother (≤68 kg). If all are correct, the average probable weight is:**

    A. 67 kg

    B. 68 kg

    C. 69 kg

    Solution:

    Possible range: 65-68 kg.

    Average = $\frac{65+66+67+68}{4} = **66.5 kg**$. *(Note: Given options may need revision; closest is 67 kg.)*

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Key Formulas:

Average = Sum of observations / Number of observations

Average speed for equal distances = $\frac{2xy}{x+y}$

If the average of n numbers is A, and a new number x is added, the new average is $\frac{nA+x}{n+1}$.

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Profit and Loss MCQs

1. **Alfred buys a scooter for Rs. 4700, spends Rs. 800 on repairs, and sells it for Rs. 5800. His gain percent is:**

   A. $4^4/_7$%

   B. $5^5/_{11}$%

   C. 10%

   D. 12%

   Solution:

   C.P. = 4700 + 800 = Rs. 5500.

   Profit = 5800 - 5500 = Rs. 300.

   Gain % = (300/5500) × 100 = **$5^5/_{11}$%**.

2. **The cost price of 20 articles equals the selling price of x articles. If profit is 25%, then x is:**

   A. 15

   B. 16

   C. 18

   D. 25

   Solution:

   Let C.P. per article = Re 1.

   S.P. of x articles = Rs. 20 → Profit = 20 - x.

   (20 - x)/x × 100 = 25 → x = **16**.

3. **If selling price is doubled, profit triples. The profit percent is:**

   A. $66\frac{2}{3}$%

   B. 100%

   C. $105\frac{1}{3}$%

   D. 120%

   Solution:

   Let C.P. = x, S.P. = y.

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3(y - x) = (2y - x) → y = 2x.

Profit % = (x/x) × 100 = **100%**.

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4. **Profit is 320% of cost. If cost increases by 25% but selling price stays constant, profit as a percentage of selling price is:**

   A. 30%

   B. 70%

   C. 100%

   D. 250%

   Solution:

   Let C.P. = Rs. 100 → Profit = Rs. 320 → S.P. = Rs. 420.

   New C.P. = Rs. 125 → New Profit = 420 - 125 = Rs. 295.

   Required % = (295/420) × 100 ≈ **70%**.

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5. **Vendor buys toffees at 6 for a rupee. To gain 20%, he must sell ____ toffees for a rupee:**

   A. 3

   B. 4

   C. 5

   D. 6

   Solution:

   C.P. per toffee = Rs. 1/6.

   S.P. per toffee = 1.2 × (1/6) = Rs. 1/5.

   ∴ **5 toffees** per rupee.

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6. **An article sold for Rs. 1920 gives the same percentage profit/loss as when sold for Rs. 1280. To make 25% profit, selling price should be:**

   A. Rs. 2000

   B. Rs. 2200

C. Rs. 2400

D. Data inadequate

Solution:

Let C.P. = x.

(1920 - x)/x = (x - 1280)/x → x = Rs. 1600.

For 25% profit: S.P. = 1.25 × 1600 = **Rs. 2000**.

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7. **Shopkeeper expects 22.5% profit. If sales are Rs. 392, his profit is:**

A. Rs. 18.20

B. Rs. 70

C. Rs. 72

D. Rs. 88.25

Solution:

C.P. = 392 / 1.225 ≈ Rs. 320.

Profit = 392 - 320 = **Rs. 72**.

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8. **Cycle bought for Rs. 1400 is sold at 15% loss. Selling price is:**

A. Rs. 1090

B. Rs. 1160

C. Rs. 1190

D. Rs. 1202

Solution:

S.P. = 85% of 1400 = **Rs. 1190**.

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9. **Sam buys 20 dozen toys at Rs. 375/dozen and sells each at Rs. 33. His profit percentage is:**

A. 3.5

B. 4.5

C. 5.6

D. 6.5

Solution:

C.P. per toy = 375/12 = Rs. 31.25.

Profit % = (1.75/31.25) × 100 = **5.6%**.

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10. **Bought at 6 for Rs. 5, sold at 5 for Rs. 6. Gain percent is:**

    A. 30%

    B. 33⅓%

    C. 35%

    D. 44%

    Solution:

    For 30 articles: C.P. = Rs. 25, S.P. = Rs. 36.

    Gain % = (11/25) × 100 = **44%**.

Key Formulas:

Profit = S.P. - C.P.

Profit % = (Profit/C.P.) × 100

S.P. = C.P. × (1 + Profit%)

C.P. = S.P. / (1 + Profit%)

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Percentage Problems MCQs

1. **A batsman scored 110 runs with 3 boundaries and 8 sixes. What percent of his score came from running?**

   A. 45%

   B. $45\frac{5}{11}\%$

   C. $54\frac{6}{11}\%$

   D. 55%

   Solution:

   Runs from boundaries/sixes: $(3\times4) + (8\times6) = 60$.

   Runs from running $= 110 - 60 = 50$.

   Percentage $= (50/110) \times 100 = \mathbf{45\frac{5}{11}\%}$.

2. **Two students appeared for an exam. One scored 9 marks more than the other, and his marks were 56% of the total marks. Their marks are:**

   A. 39, 30

   B. 41, 32

   C. 42, 33

   D. 43, 34

   Solution:

   Let marks be x and x + 9.

   $x + 9 = 0.56(2x + 9) \rightarrow x = 33$.

   Marks: **42 and 33**.

3. **A fruit seller sells 40% of his apples and has 420 left. Originally, he had:**

   A. 588 apples

   B. 600 apples

   C. 672 apples

   D. 700 apples

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Solution:

60% of x = 420 → x = 420 × (100/60) = **700**.

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4. **What percentage of numbers from 1 to 70 have 1 or 9 in their unit digit?**

   A. 1%

   B. 14%

   C. 20%

   D. 21%

   Solution:

   Numbers: 1, 9, 11, 19, 21, 29, 31, 39, 41, 49, 51, 59, 61, 69 → 14 numbers.

   Percentage = (14/70) × 100 = **20%**.

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5. **If A = x% of y and B = y% of x, then:**

   A. A < B

   B. A > B

   C. Relationship indeterminate

   D. If x < y, then A > B

   E. None of these

   Solution:

   A = B (since x% of y = y% of x).

   Answer: E.

---

6. **If 20% of a = b, then b% of 20 equals:**

   A. 4% of a

   B. 5% of a

   C. 20% of a

   D. None

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Solution:

b = 0.2a → b% of 20 = (0.2a × 0.20) = 0.04a = **4% of a**.

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7. **In a school, 20% are below 8 years old. Students above 8 years are 48 plus ⅔ of 48. Total students:**

   A. 72

   B. 80

   C. 120

   D. 100

   Solution:

   80% of x = 48 + (⅔ × 48) = 80 → x = **100**.

---

8. **Find A:B if 5% of A + 4% of B = ⅔(6% of A + 8% of B):**

   A. 2:3

   B. 1:1

   C. 3:4

   D. 4:3

   Solution:

   0.05A + 0.04B = ⅔(0.06A + 0.08B) → A/B = **4:3**.

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9. **A student multiplied by ⅗ instead of 5/3. Percentage error is:**

   A. 34%

   B. 44%

   C. 54%

   D. 64%

   Solution:

   Error = (5/3)x - (3/5)x = (16/15)x.

   Error % = [(16/15)x ÷ (5/3)x] × 100 = **64%**.

10. **In an election with 7500 votes, 20% invalid. One candidate got 55% of valid votes. The other got:**

   A. 2700

   B. 2900

   C. 3000

   D. 3100

   Solution:

   Valid votes = 80% of 7500 = 6000.

   Other candidate's votes = 45% of 6000 = **2700**.

Key Formulas:

Percentage = (Part/Whole) × 100

x% of y = y% of x

To reverse a percentage change:

Original value = (Final value) / (1 ± percentage change).

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Ratio and Proportion MCQs

1. **A and B have Rs. 1210 together. If ⁴⁄₁₅ of A's amount = ⅖ of B's amount, how much does B have?**

   A. Rs. 460

   B. Rs. 484

   C. Rs. 550

   D. Rs. 664

   Solution:

   $(4/15)A = (2/5)B \rightarrow A/B = 3/2$.

   B's share = $(2/5) \times 1210$ = **Rs. 484**.

---

2. **Two numbers are 20% and 50% more than a third number. Their ratio is:**

   A. 2:5

   B. 3:5

   C. 4:5

   D. 6:7

   Solution:

   Let third number = x.

   First number = 1.2x, Second number = 1.5x.

   Ratio = 1.2x : 1.5x = **4:5**.

---

3. **Money is distributed among A, B, C, D in ratio 5:2:4:3. If C gets Rs. 1000 more than D, B's share is:**

   A. Rs. 500

   B. Rs. 1500

   C. Rs. 2000

   D. None

   Solution:

4x - 3x = 1000 → x = 1000.

B's share = 2x = **Rs. 2000**.

---

4. **Seats for Math, Physics, Biology are in ratio 5:7:8. Increased by 40%, 50%, 75% respectively. New ratio?**

   A. 2:3:4

   B. 6:7:8

   C. 6:8:9

   D. None

   Solution:

   New seats:

   Math = $1.4 \times 5x = 7x$

   Physics = $1.5 \times 7x = 10.5x$

   Biology = $1.75 \times 8x = 14x$

   Simplified ratio = **2:3:4**.

---

5. **60L mixture has milk:water = 2:1. To make it 1:2, how much water to add?**

   A. 20L

   B. 30L

   C. 40L

   D. 60L

   Solution:

   Milk = 40L, Water = 20L.

   New ratio: $40/(20 + x) = 1/2 \rightarrow x = $ **60L**.

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6. **College boys:girls = 7:8. Increased by 20% and 10% respectively. New ratio?**

   A. 8:9

   B. 17:18

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C. 21:22

D. Cannot be determined

Solution:

New boys = 1.2 × 7x = 8.4x

New girls = 1.1 × 8x = 8.8x

Ratio = 8.4 : 8.8 = **21:22**.

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7. **Salaries of Raiz:Salman = 2:3. After Rs. 4000 increase each, new ratio = 40:57. Salman's salary?**

   A. Rs. 17,000

   B. Rs. 20,000

   C. Rs. 25,500

   D. Rs. 38,000

   Solution:

   $(2x + 4000)/(3x + 4000) = 40/57 \rightarrow x = 11,333$.

   Salman's salary = 3x + 4000 = **Rs. 38,000**.

---

8. **If 0.75 : x :: 5 : 8, then x = ?**

   A. 1.12

   B. 1.20

   C. 1.25

   D. 1.30

   Solution:

   $0.75/x = 5/8 \rightarrow x = (0.75 \times 8)/5 = $ **1.20**.

---

9. **Sum of three numbers is 98. First:Second = 2:3, Second:Third = 5:8. Second number?**

   A. 20

   B. 30

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C. 48

D. 58

Solution:

Combined ratio A:B:C = 10:15:24.

Second number = (15/49) × 98 = **30**.

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10. **Divide Rs. 782 in ratio ½ : ⅔ : ¾. First part?**

    A. Rs. 182

    B. Rs. 190

    C. Rs. 196

    D. Rs. 204

    Solution:

    Ratio = 6:8:9 (after multiplying by 12).

    First part = (6/23) × 782 = **Rs. 204**.

Key Formulas:

Ratio simplification: Multiply all terms by the LCM of denominators.

Proportion: If a:b :: c:d, then $a \times d = b \times c$.

Percentage increase in ratio: Multiply original ratio terms by (100% + increase%).

<u>Best of Luck</u>