

Ratio & Proportion Problem Solving Worksheet

Complex Ratio & Proportion Problems

I Do

A charity shop sells books, DVDs, and vinyl records.

At the start of the day:

- The ratio of the number of books to the number of DVDs is 5:3
- The ratio of the number of DVDs to the number of records is 4:1

During the day:

- 40% of the books are sold.
- $\frac{1}{6}$ of the DVDs are sold.
- No records are sold.

At the end of the day, there are 150 items left in total.

Work out how many items were sold altogether during the day.

You must show all your working.

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We Do

A fruit stall sells apples, bananas, and oranges.

At the start of the day:

- The ratio of the number of apples to the number of bananas is 3:2
- The ratio of the number of bananas to the number of oranges is 5:2

During the day:

- 60% of the apples are sold.
- $\frac{1}{5}$ of the bananas are sold.
- No oranges are sold.

At the end of the day, there are 108 pieces of fruit left in total.

Work out how many pieces of fruit were sold altogether during the day.

You must show all your working.

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You Do

A sports shop sells footballs, tennis balls, and rugby balls.

At the start of the day:

- The ratio of footballs to tennis balls is 4:5
- The ratio of tennis balls to rugby balls is 3:2

During the day:

- 25% of the footballs are sold.
- $\frac{1}{3}$ of the tennis balls are sold.
- No rugby balls are sold.

At the end of the day, there are 145 items left in total.

Work out how many items were sold altogether during the day.

You must show all your working.

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Challenge

A bakery makes cupcakes, brownies, and cookies.

At the start of the day:

- The ratio of cupcakes to brownies is 5:4
- The ratio of brownies to cookies is 3:1

During the day:

- 80% of the cupcakes are sold.
- $\frac{1}{2}$ of the brownies are sold.
- No cookies are sold.

At the end of the day, there are 130 items left in total.

Work out how many items were sold altogether during the day.

You must show all your working.

Answers & Worked Solutions

• I Do:

Find a common ratio. Books:DVDs = $5:3 = 20:12$. DVDs:Records = $4:1 = 12:3$.

Combined ratio B:D:R = $20:12:3$ (Total parts = 35).

Books sold = 40% of 20 = 8. Books left = 12.

DVDs sold = $\frac{1}{6}$ of 12 = 2. DVDs left = 10.

Records sold = 0. Records left = 3.

Total parts left = $12 + 10 + 3 = 25$ parts.

25 parts = 150 items $\rightarrow$ 1 part = 6 items.

Total parts sold = 8 (books) + 2 (DVDs) = 10 parts.

$10 \times 6 = 60$.

Answer: 60

• We Do:

Common ratio. A:B = $3:2 = 15:10$. B:O = $5:2 = 10:4$.

Combined A:B:O = $15:10:4$ (Total parts = 29).

Apples sold = 60% of 15 = 9. Apples left = 6.

Bananas sold = $\frac{1}{5}$ of 10 = 2. Bananas left = 8.

Oranges sold = 0. Oranges left = 4.

Total parts left = $6 + 8 + 4 = 18$ parts.

18 parts = 108 items $\rightarrow$ 1 part = 6 items.

Parts sold = $9 + 2 = 11$ parts.

$11 \times 6 = 66$.

Answer: 66

• You Do:

Common ratio. F:T = $4:5 = 12:15$. T:R = $3:2 = 15:10$.

Combined F:T:R = $12:15:10$ (Total = 37).

Footballs sold = 25% of 12 = 3. Footballs left = 9.

Tennis balls sold = $\frac{1}{3}$ of 15 = 5. Tennis balls left = 10.

Rugby balls sold = 0. Rugby balls left = 10.

Total parts left = $9 + 10 + 10 = 29$ parts.

29 parts = 145 items $\rightarrow$ 1 part = 5 items.

Parts sold = $3 + 5 = 8$ parts.

$8 \times 5 = 40$.

Answer: 40

• Challenge:

Common ratio. C:B = $5:4 = 15:12$. B:K = $3:1 = 12:4$.

Combined C:B:K = $15:12:4$ (Total = 31).

Cupcakes sold = 80% of 15 = 12. Cupcakes left = 3.

Brownies sold = $\frac{1}{2}$ of 12 = 6. Brownies left = 6.

Cookies sold = 0. Cookies left = 4.

Total parts left = 3 + 6 + 4 = 13 parts.

13 parts = 130 items $\rightarrow$ 1 part = 10 items.

Parts sold = 12 + 6 = 18 parts.

$18 \times 10 = 180$.

Answer: 180