

Example:

A rectangle has an area of $8\frac{1}{3} \text{ cm}^2$. If the width of the rectangle is $2\frac{1}{2} \text{ cm}$, what is the length?

Area Rectangle = Length \times Width

$$8\frac{1}{3} = \text{Length} \times 2\frac{1}{2}$$

$$\text{Length} = 8\frac{1}{3} \div 2\frac{1}{2} = \frac{25}{3} \div \frac{5}{2} = \frac{25}{3} \times \frac{2}{5} = \frac{50}{15} = \frac{10}{3} = 3\frac{1}{3} \text{ cm.}$$

1. The length of a cube is $3\frac{1}{2} \text{ cm}$. What is the area of one face? What is the volume of the cube?

$$\text{Area} = 3\frac{1}{2} \times 3\frac{1}{2} = 12\frac{1}{4} \text{ cm}^2 \quad \text{Volume} = 3\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} = 42\frac{7}{8} \text{ cm}^3$$

2. Kit enjoys charity fun runs. If he is $\frac{5}{12}$ the way round in 35 minutes. How much longer will it take him to complete the run if he maintains the same pace? $\frac{1}{12} = 7 \text{ minutes}, \frac{7}{12} = 49 \text{ minutes}$

3. Tom needs to paint his garden fence. The total length of fencing is $15\frac{1}{4} \text{ m}$. He paints $6\frac{1}{2} \text{ m}$ on Saturday and manages to paint half of the remainder the next day before he runs out of paint. How much fencing does he paint on Sunday? $15\frac{1}{4} - 6\frac{1}{2} = 8\frac{3}{4}, 8\frac{3}{4} \div 2 = 4\frac{3}{8} \text{ m}$

4. Michael walks from his house to his tennis club which is $1\frac{1}{3} \text{ km}$. His friend Joe lives $\frac{4}{5} \text{ km}$ from the tennis club. What is the maximum distance between their houses? What is the minimum distance between their houses? **Maximum Distance** = $1\frac{1}{3} + \frac{4}{5} = 2\frac{2}{15} \text{ km}$, **Minimum Distance** = $1\frac{1}{3} - \frac{4}{5} = \frac{8}{15} \text{ km}$

5. Sophie and Kate share an extra-large pizza. There is $\frac{5}{12}$ of the pizza left when they are finished. If Kate ate twice as much as Sophie, what fraction did Kate eat?

They eat $\frac{7}{12}$, Kate : Sophie = 2 : 1, Total = 3 shares

$$1 \text{ share} = \frac{7}{12} \div 3 = \frac{7}{36}, \text{ Kate eats 2 shares, } 2 \times \frac{7}{36} = \frac{7}{18}$$

6. An investment firm decide to decrease their shares in a certain company by $\frac{3}{8}$ each year. In 2021 they hold 1088 shares. How many will they hold in 2023? $1088 \times \left(\frac{5}{8}\right)^2 = 425 \text{ shares}$

7. A spinner at a funfair is split into three sectors painted red, blue and green. The probability that the spinner lands on the green sector is $\frac{1}{6}$ and the probability that it lands on the red sector is twice the probability that it lands on the blue sector. Calculate the angle that each sector makes at the centre of the spinner. **Red : Blue = 2 : 1, Blue** = $\frac{5}{6} \div 3 = \frac{5}{18}$, **Red** = $\frac{5}{18} \times 2 = \frac{5}{9}$

$$\text{Green} = \frac{1}{6} \times 360 = 60^\circ, \text{ Blue} = \frac{5}{18} \times 360 = 100^\circ, \text{ Green} = \frac{5}{9} \times 360 = 200^\circ$$

8. Tia earns £1860 per month. She spends $\frac{8}{15}$ on rent and $\frac{1}{4}$ on a holiday. Tia then spends $\frac{1}{2}$ of the remainder on food and bills. The money that's left over she saves towards a new mobile phone, how much is this?

$$\frac{8}{15} + \frac{1}{4} = \frac{47}{60}, \frac{13}{60} \text{ is the remainder, } \frac{1}{2} \text{ this} = \text{phone} = \frac{13}{120} \times 1860 = \text{£}201.50$$

9. Tom, Sarah and Jack are related. Jack is $\frac{1}{3}$ of Sarah's age and Tom is $\frac{1}{4}$ of Sarah's age. If Tom is five years younger than Jack, how old is Sarah? **Difference between Tom and Jack as a fraction** = $\frac{1}{3} - \frac{1}{4} = \frac{1}{12}$,

$$\frac{1}{12} \text{ of Sarah's age} = 5 \text{ years, Sarah} = 5 \times 12 = 60$$