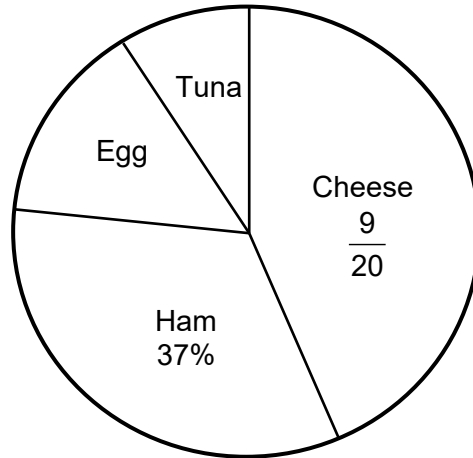


OCR 02 Fractions, Decimals and Percentages (Higher)

Do not use a calculator for questions 1 to 8.

1. Multiply 3.85 by 0.7.
2. Express 55p as a percentage of £4.
3. Calculate $0.7 \div 0.4$.
4. Arif watches two films. The first film is $1\frac{3}{4}$ hours long and the second is $2\frac{1}{3}$ hours long.
What is the total length of the two films?
5. Change $\frac{13}{33}$ into a recurring decimal.
6. Express the recurring decimal $0.\dot{2}1\dot{3}$ as a fraction.
7. Calculate $2\frac{3}{8} \div 1\frac{1}{18}$.
8. Simplify $\frac{2x}{3} + \frac{x}{5}$.
9. The value of a car was £24 600 when it was new. After two years it lost 34.2% of its value.
How much is the car worth after two years?
10. The total cost of some equipment is £4350, including 15% sales tax.
Calculate the cost without sales tax.
11. Use fractions to explain why dividing by 0.01 is equivalent to multiplying by 100.

12. Elle is drawing a pie chart to show her friends' favourite type of sandwich. The proportions for cheese and ham are shown below. Egg sandwiches are twice as popular as tuna sandwiches. Show that 12% of her friends chose egg sandwiches as their favourite.



Not to scale

13. Kara scored 26 out of 50 on a test. Jacob scored 52 out of 60 on a test. Jacob says he did twice as well in his test as Kara did in hers. Evaluate his statement.
14. Max invests £300 in a savings account that pays 5% compound interest at the end of each year. No money is withdrawn from the account. Show that it will take 15 years for his investment to double.
15. This year, an individual will pay 0% tax on earnings up to £11 500 and then 20% tax on any earnings from £11 500 up to £45 000. Martha's salary this year is £36 000. Show that Martha earns £31 100 after she has paid tax.
16. Max buys some apples. He sells $\frac{3}{5}$ of the apples and of the remaining apples $\frac{1}{3}$ are rotten and are thrown away. Max has 24 apples left. How many apples did Max buy?
17. A bridge $2\frac{3}{4}$ km long needs painting. $\frac{3}{8}$ is painted in week 1, $\frac{1}{4}$ in week 2, $\frac{5}{16}$ in week 3 and the remainder in week 4. What length of the bridge is painted in week 4?
18. Myra improved her 800 m running time by 2 seconds. Her previous best time was 2 minutes 40 seconds. What is her percentage improvement?
19. Four friends are going on a holiday together, which costs £1750 in total. Sam and Jo are married and pay 36% of the holiday cost, which they split equally between them. Nic pays 0.27 of the holiday cost and then Lin pays the rest. Calculate the holiday cost for each person.
20. Four friends order one meat pizza and one vegetarian pizza. First Troy takes $\frac{1}{5}$ of each pizza. Barney then takes 50% of what remains of the meat pizza and Chae takes 0.75 of what remains of the vegetarian pizza. Finally Elsa takes the rest of the pizzas. What is Elsa's share?

Answers

1. 2.695
2. 13.75%
3. $1\frac{3}{4}$ or 1.75
4. 4 hours and 5 minutes or 245 minutes
5. $0.\dot{3}9$
6. $\frac{213}{999}$
7. $2\frac{1}{4}$ or 2.25
8. $\frac{13x}{15}$
9. £16 186.80
10. £567.39
11. $0.01 = \frac{1}{100}$ so dividing by $\frac{1}{100}$ is the same as multiplying by 100 using the rules of dividing fractions.
12. Cheese = $\frac{9}{20} = 0.45$. Ham = $37\% = 0.37$.
 Tuna + egg = $1 - (\text{cheese} + \text{ham}) = 1 - (0.45 + 0.37) = 0.18$
 Ratio of tuna : egg is 1 : 2.
 Percentage of colleagues who chose egg sandwiches = $\frac{2}{3} \times 0.18 = 0.12 = 12\%$.
13. Although Jacob did score twice as many marks as Kara, proportionally Kara scored 52% and Jacob scored 86.7% so Jacob did not do twice as well as Kara.
14. $300 \times 1.05^{14} = \text{£}593.98$
 $300 \times 1.05^{15} = \text{£}623.68$
 It will take 15 years to double his money.
15. $36\,000 - 11\,500 = 24\,500$
 $24\,500 \times 0.2 = \text{£}4\,900$ (tax paid)
 Earnings after tax = $36\,000 - 4\,900 = \text{£}31\,100$
16. 90 apples

17. $\frac{1}{16}$ of the bridge was painted in week 4. This was 0.172 km.
18. 2 minutes 40 seconds = 160 seconds. $\frac{2}{160} \times 100 = 1.25\%$.
19. The cost for Sam and Jo = $1750 \times \frac{36}{100} = £630$, which is £315 each.
 The cost for Nic = $1750 \times 0.27 = £472.50$.
 The cost for Lin = $1750 - 630 - 472.50 = £647.50$ (or $1750 \times (1 - 0.36 - 0.27) = £647.50$).
20. Troy takes 0.2 of the meat pizza and 0.2 of the vegetarian pizza.
 Barney takes $(1 - 0.2) \times 0.5 = 0.4$ of the meat pizza.
 Chae takes $(1 - 0.2) \times 0.75 = 0.6$ of the vegetarian pizza.
 There is 0.4 of the meat pizza left and 0.2 of the vegetarian pizza left.
 So Elsa's share is $\frac{0.4 + 0.2}{2} = 0.3$ (Allow equivalences in fractions, decimals or percentages)

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Multiply decimals			
AO1	2	Express one quantity as a percentage of another			
AO1	3	Divide a decimal by a decimal			
AO1	4	Calculate with fractions greater than 1			
AO1	5	Change a fraction into a recurring decimal			
AO1	6	Convert a recurring decimal into an exact fraction			
AO1	7	Divide mixed numbers			
AO1	8	Simplify algebraic fractions			
AO1	9	Decrease a quantity by a decimal percentage			
AO1	10	Calculate with percentage			
AO2	11	Convert between decimals and fractions			
AO2	12	Convert between fractions, decimals and percentages			
AO2	13	Assess validity of an argument with percentages			
AO2	14	Calculate percentage change in context			
AO2	15	Work out a percentage of an amount			
AO3	16	Solve a problem involving fractions of a quantity			
AO3	17	Solve a problem involving fractions of a quantity			
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AO3	20	Solve a problem involving fractions, decimals and percentages of an amount			

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