

# Oxford Revise | AQA GCSE Maths Higher | Answers

## Chapter 16 Ratio

Question	Answer	Extra information	Marks
16.1	$5:12:13$ $= 1:2.4:2.6$ $= 2:4.8:5.2$ Thus, the perimeter is $2 + 4.8 + 5.2 = 12$	Method to find at least one of the sides Adding all three sides Correct answer	1 1 1
16.2	$7 - 2 = 5$ parts, which represents "90 more" $90 \div 5 = 18$ , so each part represents 18 items $7 \times 18 = 126$ pencils	Dividing 90 by 5 Correct answer	1 1
16.3	$AB:BC = 6:5$ $= 12:10$ $AB:BC:CD = 12:10:13$ $12 + 10 + 13 = 35$ Each part = $105 \div 35 = 3$ cm $BC = 10 \times 3 = 30$ cm	$12:10$ or $12:10:13$ Dividing 105 by the three-ratio sum Correct answer	1 1 1

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16.4	Hayley = $x$ Kayleigh = $x - 2$ Bailey = $2(x - 2)$ Sum: $x + (x - 2) + 2(x - 2) = 4x - 6 = 38$ $4x = 44$ $x = 11$ Thus Bailey : Hailey : Kayleigh = 18 : 11 : 9	Any two correct algebraic expressions Sum of the three expressions = 38 Solving for $x$ Correct ratio	1 1 1 1
16.5	Frida has $x$ cards Carl has $1.2x$ cards $x + 1.2x = 44$ $2.2x = 44$ $x = 20$ Frida has 20 and Carl has 24	Attributing each amount with an expression using a variable Adding them together Solving	1 1 1
16.6	New ratio = $(2 \times 1.5) : (1 \times 1.25) = 3 : 1.25 = 12 : 5$	Either 1.5 or 1.25 used as a multiplier 3 : 1.25 or equivalent ratio Correct answer	1 1 1

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16.7	$2x = 3y$ $x + 8 = 4(y \div 2)$ Solve by elimination: $2(2y - 8) = 3y$ $4y - 16 = 3y$ $y = 16$ $\Rightarrow x = 24$	Forming a correct equation in any form, eg. $\frac{x}{y} = \frac{3}{2}$ Both equations correct Attempt to solve by substitution or elimination Either $x$ or $y$ correct Fully correct	1  1 1  1 1
16.8	$\frac{4}{7}$ of the coins are copper; $\frac{3}{7}$ are silver $\frac{3}{10}$ of the copper coins are small Fraction of all coins that are small copper: $\frac{3}{10} \times \frac{4}{7} = \frac{12}{70} \left( = \frac{6}{35} \right)$ $\frac{1}{3}$ of the silver coins are small $\frac{1}{3} \times \frac{3}{7} = \frac{1}{7}$ Total fraction of the coins that are small: $\frac{6}{35} + \frac{1}{7} = \frac{11}{35}$	$\frac{4}{7}$ or $\frac{3}{7}$  $\frac{3}{10}$ or $\frac{1}{3}$  $\frac{3}{10} \times \frac{4}{7} = \frac{12}{70} \left( = \frac{6}{35} \right)$ or $\frac{1}{3} \times \frac{3}{7} = \frac{1}{7}$  Adding answers  Correct final answer	1  1  1  1  1

Question	Answer	Extra information	Marks
16.9	$\frac{2x-5}{6} = \frac{1}{6-x}$ $12x - 30 - 2x^2 + 5x = 6$ $2x^2 - 17x + 36 = 0$ $(2x-9)(x-4) = 0$ $x = \frac{9}{2} \quad \text{or} \quad x = 4$	Forming a correct equation in any form Rearranging to a quadratic = 0 Factorising Both answers correct	1 1 1 1
16.10	$15\,285 \times 1.2 = 18\,342$ Deposit = $18\,342 - (10 \times 1384.20) = 4500$ Ratio is 4500 : 13842 $= 250 : 769$	Attempt to increase by 20% $10 \times 1384.20$ Subtracts to find deposit Ratio in the correct order Simplified ratio	1 1 1 1 1
16.11	Speed of light = $4.8555 \times 10^9 \div 4.5 = 1\,079\,000\,000$ km/h Speed of sound = $37\,044 \div 3 = 12\,348$ km/h Ratio = $1\,079\,000\,000 : 12\,348$ $= 87\,382.572\dots : 1$ $= 87\,400 : 1 \quad (3 \text{ sf})$	Finds speeds per hour for each Write ratio in the correct order Ratio in the form n : 1 Correct answer, to 3 sf	1 1 1 1
16.12	$1.25 \times 4 = 5$ $2.2 \times 5 = 11$ So, the ratio P : Q : R : S = 4 : 5 : 5 : 11 (= 25 parts) $£425 \div 25 = £17$ $11 \times 17 = £187$ , the amount that Stephanie gets	$1.25 \times 4$ or $2.2 \times 5$ Divides 425 by the sum of the ratios Multiplies answer by 11 Correct answer	1 1 1 1

Question	Answer	Extra information	Marks
16.13	$\frac{3}{8} \times 560 = 210$ (oranges) $15\% \text{ of } 560 = 84$ (bananas) $560 - (210 + 84) = 266$ $266 \div (8 + 11) = 14$ $14 \times 8 = 112$ 112 pears	Attempt to work out $\frac{3}{8}$ of 560 Attempt to work out 15% of 560 Subtract to find number of apples and pears Divides 266 by 19, then multiplies by 8 Correct answer	1 1 1 1 1
16.14	$\frac{3x^2}{5x+4} = \frac{2}{1}$ $3x^2 = 10x + 8$ $3x^2 - 10x - 8 = 0$ $(3x + 2)(x - 4) = 0$ $x = -\frac{2}{3}$ or $x = 4$	Attempt to form an equation Quadratic equation achieved Attempt to solve/factorise Both correct solutions	1 1 1 1
16.15	Initially, Deshawn has $3x$ marshmallows, Amara has $2x$ and Harper has $5x$ Harper gives 5 to Amara, so she now has $5x - 5$ Amara receives 5 from Harper, but eats one of them, so she now has $2x + 5 - 1 = 2x + 4$ The ratio $4 : 4 : 5$ tells us that Deshawn and Amara now have the same amount, so $3x = 2x + 4$ , thus $x = 4$ The original number of marshmallows per person was: Deshawn with 8, Amara with 12 and Harper with 20.	Attempt to use algebra Solving an equation Correct final answer  Note that solutions based on trial-and-error score a maximum of 2 marks	1 1 1

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16.16	$3\frac{2}{3} \div 2\frac{1}{2} = \frac{11}{3} \div \frac{5}{2}$ $= \frac{11}{3} \times \frac{2}{5}$ $= \frac{22}{15}$ $= 1\frac{7}{15}$	Converts to improper fractions Inverts the second fraction and multiplies Correct answer	1 1 1
16.17	$\frac{x^2 + 7x + 10}{x^2 + 2x - 15} \times \frac{x^2 + x - 12}{x^2 + 2x}$ $= \frac{\cancel{(x+2)} \cancel{(x+5)}}{\cancel{(x+5)} \cancel{(x-3)}} \times \frac{\cancel{(x-3)} (x+4)}{x \cancel{(x+2)}}$ $= \frac{x+4}{x} \left( = 1 + \frac{4}{x} \right)$	Correctly factorising at least two of the four quadratics Correctly factorising all four quadratics Correctly cancelling terms Fully correct, simplified answer, in either form	1 1 1 1

