Oxford Revise | Edexcel 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 = $(2\times1.5):(1\times1.25)=3:1.25=12:5$	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	$\frac{2x-5}{6}=\frac{1}{6-x}$ $12x-30-2x^2+5x=6$ $2x^2-17x+36=0$ $(2x-9)(x-4)=0$ $x=\frac{9}{2}$ or $x=4$	Forming a correct equation in any form Rearranging to a quadratic $=0$ Factorising Both answers correct	1 1 1 1
16.10	$15\,285\times1.2=18\,342$ Deposit = $18\,342-(10\times1384.20)=4500$ Ratio is $4500:13842$ $=250:769$	Attempt to increase by 20% 10×1384.20 Subtracts to find deposit Ratio in the correct order Simplified radio	1 1 1 1 1
16.11	Speed of light = $4.8555\times10^9\div4.5=1\,079\,000\,000$ km/h Speed of sound = $37\,044\div3=12\,348$ km/h Ratio = $1\,079\,000\,000:12\,348$ $=87\,382.572\ldots:1$ $=87\,400:1$ (3 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	$1.25\times4=5$ $2.2\times5=11$ So, the ratio P : Q : R : S = 4 : 5 : 5 : 11 (= 25 parts) £425 ÷ 25 = £17 11 × 17 = £187, the amount that Stephanie gets	1.25×4 or 2.2×5 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% 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

Question	Answer	Extra information	Marks
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