Oxford Revise | AQA GCSE Maths Higher | Answers

Chapter 17 Compound measures and multiplicative reasoning

Question	Answer	Extra information	Marks
17.1	Rate $= \frac{\text{Volume}}{\text{time}}$ $20 = \frac{2400}{t}$ $t = \frac{2400}{20}$ $t = 120$ Time $= 120$ seconds	$2400 \div 20$ Correct answer, including units	1 1
17.2	Density $= \frac{\text{mass}}{\text{volume}} = \frac{38\,700}{5} = 7740\,\text{kg}/\text{m}^3$	Convert g to kg Use of the formula for density Correct answer	1 1 1
17.3	Speed $= \frac{\text{distance}}{\text{time}}$ $47 = \frac{5.64}{t}$ $t = \frac{5.64}{47} = 0.12\,\text{hours}$ 0.12 hours $= 7.2$ minutes 0.2 minutes $= 12$ seconds Therefore, time is 7 minutes and 12 seconds	Convert to consistent units Attempt to use formula to find the time 0.12 hours Correct answer	1 1 1 1

ISBN 9781382039833

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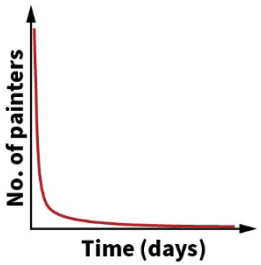
17.4	France: $58\,800 \times 1.15 = £67\,620$ $£67\,620 \div 12 = £5635$ per acre Argentina: $4\,520\,000 \div 70.12 = £64\,460.92$ $£64\,460.92 \div 15 = £4297.39$ per acre Lower cost per acre in Argentina	Convert to pounds per acre Correct conclusion	3 1
17.5 (a)	$12 \times 6 = 72$ painter days' $72 \div 18 = 4$ days	$12 \times 6 \div 18$, or equivalent Correct answer	1 1
17.5 (b)	$72 \div 3 = 24$ painters	$12 \times 6 \div 3$, or equivalent Correct answer	1 1
17.5 (c)		Correct shape Graph approaches (but does not touch) both sets of axes.	1 1
17.6 (a)	$T = \frac{k}{W}$ $5 = \frac{k}{4}$ $\Rightarrow k = 20$ $T = \frac{20}{W}$	Setting up a formula to represent the inverse relationship Correct constant k Correct answer	1 1 1

Question	Answer	Extra information	Marks
17.6 (b)	$T = \frac{20}{8} = 2.5$		2
17.7 (a)	$M = kH^2$ $500 = k \times 0.6^2$ $\Rightarrow k = \frac{12500}{9}$ $M = \frac{12500H^2}{9}$	Setting up a formula to represent the inverse relationship Correct constant k Correct answer	1 1 1
17.7 (b)	$M = \frac{12500 \times 1.5^2}{9} = 3125$ kg		2
17.8	f must be inversely proportional to h^2: $f = \frac{k}{h^2} \Rightarrow 6 = \frac{k}{0.5^2} \Rightarrow k = \frac{3}{2}$ $\Rightarrow f = \frac{3}{2h^2}$	1 mark for describing the proportionality of f and h. 1 mark for $f = \frac{k}{h^2}$ or equivalent 1 mark for correct value of k 1 mark for correct final answer	1 1 1 1
17.9	Original density $= \frac{30}{100} = 0.3$ kg/cm^3 New density $= \frac{70}{140} = 0.5$ kg/cm^3 % increase $= \frac{0.5 - 0.3}{0.3} \times 100\% = 66.\dot{6}\%$ Pat is correct	Finding original and new density Obtaining a % increase	1 1

Question	Answer	Extra information	Marks
17.10	$f = k\sqrt{g}$ $2 = k\sqrt{324}$ $k = \frac{1}{9}$ $\Rightarrow f = \frac{\sqrt{g}}{9}$ Now, $g = \frac{K}{h^2}$ $225 = \frac{K}{0.2^2}$ $K = 9$ $\Rightarrow g = \frac{9}{h^2}$ $f^2 = \frac{g}{81} = \frac{1}{81}\left(\frac{9}{h^2}\right) = \frac{1}{9h^2}$ $f = \sqrt{\frac{1}{9h^2}} = \frac{1}{3h}$	$f = k\sqrt{g}$ $g = \frac{K}{h^2}$ Substitutes values of f and g to find k, or values of g and h to find K. k or K correct Correct answer	1 1 1 1 1

Question	Answer	Extra information	Marks
17.11	$v = \frac{k}{w^2}$ $2 = \frac{k}{9x^2}$ $k = 18x^2$ $\Rightarrow v = \frac{18x^2}{w^2}$ When $w = 5x$: $v = \frac{18x^2}{25x^2} = \frac{18}{25} = 0.72$	$v = \frac{k}{w^2}$ Substituting $v = 2$ and $w = 3x$ correctly Complete method leading to correct answer	1 1 1
17.12	1.98 km = 1980 m Lower Bound for distance = 1975 m Upper Bound for distance = 1985 m Lower Bound for time = 57.5 s Upper Bound for time = 62.5 s Upper Bound for speed = $\frac{1985}{57.5} = 34.521...$ Lower Bound for speed = $\frac{1975}{62.5} = 31.6$ Both round to 30 m/s to 1 sf	1975 or 57.5 1985 or 62.5 Correct method for UB of speed of LB of speed 34.5217… and 31.6 correct Correct answer with explanation	1 1 1 1 1

Question	Answer	Extra information	Marks
17.13	Egg without shell $= 44.5$ g 11% decrease means a multiplier of 0.89 Egg with shell $\times\ 0.89 = 44.5$ Therefore, egg with shell = $\frac{44.5}{0.89} = 50$ g	Correct multiplier for 11% decrease Sets up correct relationship between shell on and off Correct answer	1 1 1
17.14	The ratio of their money is originally $2:1$ So, the actual amount of money that each person has can be represented as $2x$ and $1x$, respectively. They each pay £9 for lunch, so they now have $2x-9$ and $x-9$ pounds, respectively, and this is in the ratio of $5:2$. Hence: $\frac{2x-9}{x-9} = \frac{5}{2}$ $5x-45 = 4x-18$ $x = 27$ That means Ted started with £27, and Fred started with £54	Letting x and $2x$ represent the original amounts Writing $x-9$ and $2x-9$ as the current amounts Setting up the ratio equation $\frac{2x-9}{x-9} = \frac{5}{2}$ Fully correct	1 1 1 1