

Q1. (2017)

22	Alternative method 1	
	$d = kt^2$ or $45 = k \times 3^2$ or $45 \div 9$	M1 oe equation
	$d = 5t^2$ or $(k =) 5$	M1dep oe equation 245 implies M2
	their 5×10^2 or 500	oe M3 $\left(\frac{10}{3}\right)^2 \times 45$ oe
	455	A1
	Alternative method 2	
	$kd = t^2$ or $k \times 45 = 3^2$ or $9 \div 45$	M1 oe equation
	$0.2d = t^2$ or $(k =) 0.2$	M1dep oe equation 245 implies M2
	$10^2 \div$ their 0.2 or 500	oe M3 $45 \div \left(\frac{3}{10}\right)^2$ oe
	455	A1
	Additional Guidance	
	$d \propto t^2$ with no further valid working	Zero
	$d = kt$ or $d = kt^3$ or $d = \frac{k}{t^2}$ etc not recovered	Zero
	$45 : 9$ with no further valid working	Zero
	$d = 5t^2$ or $(k =) 5$ scores M2 even if not subsequently used	M2
	$d = kt^2$ or $45 = k \times 3^2$ or $45 \div 9$ scores M1 even if not subsequently used	M1
	$0.2d = t^2$ or $(k =) 0.2$ scores M2 even if not subsequently used	M2
	$kd = t^2$ or $k \times 45 = 3^2$ or $9 \div 45$ scores M1 even if not subsequently used	M1
	Allow use of other letters	

Q2. (2021)

- 15 L is directly proportional to D^2
 $L = 85$ when $D = 10$

(A)

Q	Answer	Mark	Comments
15(a)	Alternative method 1		
	$L = kD^2$	M1	oe equation
	$85 = 10^2k$ or $85 = 100k$ or $(k =) 0.85$	M1dep	oe implies M2
	$L = 0.85D^2$	A1	oe equation
	Alternative method 2		
	$cL = D^2$	M1	oe equation
	$85c = 10^2$ or $85c = 100$ or $(c =) \frac{100}{85}$	M1dep	oe allow $(c =) [1.176, 1.18]$ implies M2
	$\frac{100}{85}L = D^2$	A1	oe equation allow $[1.176, 1.18]L = D^2$
	Additional Guidance		
	Condone use of α for up to M1M1A0 eg Alt 1 $L \propto kD^2$ $85 \propto 100k$ $L \propto 0.85D^2$		M1 M1 A0
	$L = 0.85D^2$ oe		M1M1A1
	$L \propto D^2$ is M0 with no further correct working		

(B)

Q	Answer	Mark	Comments
15(b)	Alternative method 1 If using alt 1 in (a)		
	their $k \times 5^2$	M1	oe their k from (a)
	21.25	A1ft	oe correct or ft their $k \times 5^2$
	Alternative method 2 If using alt 2 in (a)		
	$5^2 \div \text{their } c$	M1	oe their c from (a)
	21.25	A1ft	oe correct or ft $5^2 \div \text{their } c$ do not follow through an approximated value for $\frac{100}{85}$
	Additional Guidance		
	$L \propto 21.25$ on answer line		M1A0
	Alt 2 (a) $1.18L = D^2$ (scores 3 marks in (a)) (b) $25 \div 1.18 = 21.19$		M1A0