1	Use of 2 hrs 42 mins = 2.7 hrs **or** 162 mins		4	B1	
	e.g. 90×2.7 (= 243) **or** e.g. $\frac{90}{60} \times 162 (= 243)$ or e.g. $\frac{S}{90} = \frac{2.7}{3}$			M1	for use of $D = S \times T$ (accept use of their time e.g. 90×2.42) **or** for setting up an equation using proportion
	e.g. "243" $\div$ 3 **or** $(S =) 90 \times \frac{2.7}{3}$			M1	(dep on M1) for their $D \div 3$ **or** for solving their equation
		81		A1	
					Total 4 marks

2	e.g. 1.5×1.5 (= 2.25 oe)		3	M1	for calculating the area of the square, may be seen embedded within a calculation
	e.g. $34.8 \times$ "2.25"			M1	for a complete method to find the force
		78.3		A1	oe
					Total 3 marks

3	$\pi \times 2.5^2 \times 15$ ($= 93.75\pi = 294.5243...$)		5	M1	for using the formula for volume of cylinder
	$21.5 = \frac{m}{"294.5243"}$			M1	for using $d = \frac{m}{v}$ with *their* intended volume *v*
	$(m =) 21.5 \times$ '294.5243...' ($= 6332.272692$)			M1	for rearranging for $m = d \times v$
	'6332.27269' $\div$ 1000 $\times$ 5 (=31.661…) or '6332.27269' $\div$ 6 $\div$ 1000 (= 1.055…) or '6332.27269'$\times$ 5 **and** 30 $\times$ 1000 (=30 000) or 30 $\div$ ('6332.27269' $\div$ 1000) (= 4.7376…)			M1	for a correct calculation that would enable a conclusion to be made based on mass
		No and correct comparable figure(s)		A1	for No oe and (31.6 to 31.7 **or** 1.05 to 1.06 **or** 4.70 to 4.74) seen
					Total 5 marks

Alternative Mark Scheme for Q3					
3	$\pi \times 2.5^2 \times 15$ ($= 93.75\pi = 294.5243...$)		5	M1	for using the formula for volume of cylinder
	$21.5 = \frac{30\,000}{v}$ or $21.5 = \frac{30\,000 \div 5}{v}$			M1	for using $d = \frac{m}{v}$ with given *d* and *m*
	$(v =) \frac{30\,000}{21.5}$ (=1395.34…) or $(v =) \frac{30\,000}{21.5 \times 5}$ (=279.069…)			M1	for rearranging for $v = \frac{m}{d}$ for either one nugget, or all five nuggets.
	"1395.34" **and** "294.52" $\times$ 5 (= 1472.62) or "279.06" **and** "294.52"			M1	for correct calculations that would enable a conclusion to be made based on volumes
		No and correct comparable figure(s)		A1	awrt 3sf
					Total 6 marks

4	$\times$1000 ($\div$60 $\div$ 60) or $\div$3600 or sight of 81 000 or 1350 or 0.0225		3	M1	For one of $\times$1000 (eg sight of 81 000) or ($\div$60 $\div$ 60) or $\div$3600 oe
	$\frac{81 \times 1000}{60 \times 60}$ oe eg $\frac{81}{3.6}$ or $81 \times \frac{5}{18}$ oe			M1	For a fully correct method with correct use of brackets eg $81000 \div 60 \times 60$ is M1 only if not recovered
		22.5		A1	or $\frac{45}{2}$ or $22\frac{1}{2}$
					Total 3 marks