

Qu	Scheme	Mark	AO															
3. (a)	<table><tr><th>Class</th><th>Frequency</th><th>Cum. Frequency</th></tr><tr><td>0 – 1</td><td>15</td><td>15</td></tr><tr><td>1 – 2</td><td>35</td><td>50</td></tr><tr><td>2 – 3.5</td><td>75</td><td>125</td></tr><tr><td>3.5 – 4.5</td><td>55</td><td>180</td></tr></table>	Class	Frequency	Cum. Frequency	0 – 1	15	15	1 – 2	35	50	2 – 3.5	75	125	3.5 – 4.5	55	180	M1	2.1
	Class	Frequency	Cum. Frequency															
	0 – 1	15	15															
	1 – 2	35	50															
	2 – 3.5	75	125															
	3.5 – 4.5	55	180															
		A1	1.1b															
	$[Q_2 =](3.5) + \frac{\frac{256}{2} - "125"}{"55"} \times (4.5 - 3.5) \text{ or } (4.5) - \frac{"180" - \frac{256}{2}}{"55"} \times 1$ $= 3.5545\ldots \text{ awrt } \underline{\underline{3.55}}$	M1	2.1															
		A1	1.1b															
		(4)																
(b)	Need area under curve to be 256 so $\int_{(0)}^{(8)} kx(8 - x) \, dx = 256$	M1	3.1a															
	$k \left[4x^2 - \frac{x^3}{3} \right]_{(0)}^{(8)} = 256$	M1	1.1b															
	$\left\{ k \left[4 \times 8^2 - \frac{8}{3} \times 8^2 \right] = 256 \Rightarrow \right\} \quad \underline{\underline{k = 3}}$	A1	1.1b															
		(3)																
(c)	[By symmetry median =] <u>4</u>	B1	2.2a															
		(1)																
		(8 marks)																

	Notes
(a)	1st M1 for an attempt to form frequency table (at least 1st 4 rows and freq <u>or</u> cum freq seen must have the frequency of 75 correct and can condone one error/omission in 15, 35, 55) Frequencies or cum freq may be seen on bars of the histogram 1st A1 for identifying class, freq and cum freq (i.e. highlighted values from the table) <u>or</u> sight of 3.5-4.5, freq of 55 and “128” – 125 or 180 – “128” <u>or</u> diagram with 125, “128”, 180, 3.5 & 4.5 May be implied by values in 2nd M1expression 2nd M1 for a correct calculation for Q₂ (condone error in end point e.g. 3.45 or 3.49 etc) Can ft their “125” (provided > 100) and their “55” Allow use of (n + 1), usually see 128.5 – ... leading to 3.5636... or awrt 3.56 2nd A1 awrt 3.55 but 3.555 is fine (allow 3.56 if (n + 1) being used ...need sight of $\frac{257}{2}$ etc) Correct answer with no incorrect working scores 4/4
(b)	1st M1 for identifying the need to find the area under the curve by integrating 2nd M1 for correct integration and = 256 (condone missing limits) A1 for k = 3 [May see use of calculator for the integration so score 2nd M1A1 together]
(c)	NB The answer to part (c) may be written within the question. B1 for 4 (Independent of their value of k but must be their “x” value) NB when k = 0.25 and x = 4 gives y = 4 so must be clear they intend median = 4 The statement in part (c) “k = 4” is B0