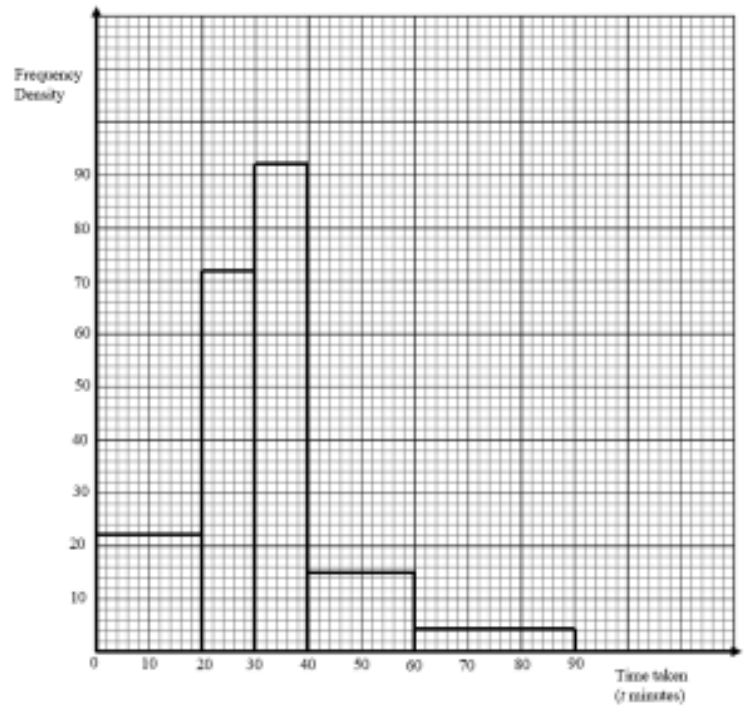
Question	Answer	Marks	Guidance
(a)	<table><tr><td>Class width</td><td>20</td><td>10</td><td>10</td><td>20</td><td>30</td></tr><tr><td>Frequency density</td><td>22</td><td>72</td><td>92</td><td>15</td><td>4</td></tr></table> 	**M1** **A1** **B1** **B1**	At least 4 frequency densities calculated (Frequency ÷ class width, e.g. $\frac{440}{20}\left(condone\ \frac{440}{19.5}, \frac{440}{20.5}\right)$ Accept unsimplified, may be read from graph using *their* scale All heights correct on graph **NOT FT** Bar ends at [0,] 20, 30, 40, 60, 90 at axis with a horizontal linear scale with at least 3 values indicated. $0 \leqslant$ horizontal scale $\leqslant 90$ Axes labelled frequency density (fd), time (t) and minutes (mins) or in a title. Linear vertical scale, with at least 3 values indicated $0 \leqslant$ vertical axes $\leqslant 92$ (condone 90 used).
		4	

Question	Answer	Marks	Guidance
(b)	<table><tr><td>Midpoints</td><td>10</td><td>25</td><td>35</td><td>50</td><td>75</td></tr></table>	**B1**	At least 4 correct midpoints seen
	[Mean = 31.44 given] [Variance = $\frac{440\times10^2+720\times25^2+920\times35^2+300\times50^2+120\times75^2}{2500}-31.44^2$] $=\frac{44000+450000+1127000+750000+675000}{2500}-31.44^2$ [$=\frac{3046000}{2500}-31.44^2=229.9264$] Or Variance = $\frac{440(10-31.44)^2+720(25-31.44)^2+920(35-31.44)^2+300(50-31.44)^2+120(75-31.44)^2}{2500}$ $=\frac{202256+29860+11659+103342+227697}{2500}=\frac{574814}{2500}=229.9264$	**M1**	Correct formula for variance or standard deviation (− mean^2 included with *their* midpoints (not upper bound, lower bound, class width, frequency density, frequency or cumulative frequency) and *their* ∑f if calculated. Condone 1 data error.
	Standard deviation = 15.2	**A1**	WWW, allow 15.16[3…]
		3	
(c)	30–40	**B1**	
		1	
(d)	Stays the same, data still in same intervals	**B1**	Frequencies unchanged
		1	