

Question Number	Answer	Mark
20(a)	Reverse scale (1)	2
	Approximately logarithmic values (1) [With realistic values of temperature and temperature of Sun about 6000 K]	
20(b)	<p>(This star cluster is not a young star cluster because)</p> <p>This cluster has red giant stars on the top right of the diagram (1)</p> <p>And white dwarf stars bottom left of diagram (1)</p> <p>A young cluster would only have a main sequence (1)</p> <p>Or Red giant stars only occur in the later stages of a star's evolution</p> <p>Or White dwarf stars only occur in the later stages of a star's evolution</p> <p>If no marks can be awarded, award max 1 for: The cluster has red giant stars and white dwarf stars</p> <p>[Accept positions of red giant stars and white dwarf stars shown on the diagram]</p>	3
20(c)	<p>The luminosity of the standard candle is known (1)</p> <p>Measure/determine intensity of radiation from V1 [standard candle] (1) [do not accept 'calculate']</p> <p>Use inverse square law to calculate distance (to cluster)</p> <p>Or use $I = \frac{L}{4\pi d^2}$ to determine distance, where I is intensity and L is luminosity (1)</p> <p>Distance is too large (for V1 to be in a nearby cluster) (1) [Must have the idea of being too far away, rather than just being far away]</p>	4
Total for question 20		9