Question			Answer	Max mark	Additional guidance
5.	(a)	(i)	$\left(\frac{3\cdot83\times10^{30}}{5\cdot69\times10^{27}}\right)=673$ 1 (Star is) 3 (orders of magnitude) greater 1 **OR** Exoplanet is 3 (orders of magnitude) smaller	**2**	Sig figs: accept 670, 673·1, 673·11 Or $\left(\frac{10^{30}}{10^{27}}\right)=1000 \text{ or } 10^3$ Or $(30\text{-}27)=3$ **1** '3 greater' on its own is worth 2 marks. Care should be taken where candidates answer by the reciprocal method – 2 marks are still available. $\left(\frac{5\cdot69\times10^{27}}{3\cdot83\times10^{30}}\right)=1\cdot49\times10^{-3}$ **1** Comparison statement **1** 'Greater' on its own – 0 marks
		(ii)	$F=G\frac{m_1m_2}{r^2}$ 1 $F=6\cdot67\times10^{-11}\frac{5\cdot69\times10^{27}\times3\cdot83\times10^{30}}{\left(3\cdot14\times10^{11}\right)^2}$ 1 $F=1\cdot47\times10^{25}\text{ N}$ 1	**3**	Sig figs: Accept 1·5, 1·474, 1·4743
	(b)	(i)	$z=\frac{v}{c}$ 1 $z=\frac{6\cdot60\times10^{3}}{3\cdot00\times10^{8}}$ 1 $z=2\cdot20\times10^{-5}$ 1	**3**	Sig figs: Accept 2·2, 2·200, 2·2000
		(ii)	Greater (than)	**1**	Accept any word synonymous with 'greater'. Any correct suggestion followed by wrong physics 0 marks.