10(a)(i)	total power of radiation emitted (by the star)
10(a)(ii)	standard candle has known luminosity
	measure the radiant flux intensity
	use $F = L / (4\pi d^2)$ to calculate d
10(b)(i)	$v = 2\pi R / T$
	$v = 3.00 \times 10^8 \times (656.2877 - 656.2831) / 656.2831$
	$R = [3.00 \times 10^8 \times (656.2877 - 656.2831) / 656.2831] \times (2.07 \times 10^6) / 2\pi = 6.93 \times 10^8$ m
10(b)(ii)	Z is moving towards Earth
	so observed wavelength is less than the emitted wavelength
10(b)(iii)	$L = 4\pi\sigma r^2 T^4$ $3.8 \times 10^{26} = 4\pi \times 5.67 \times 10^{-8} \times (6.93 \times 10^8)^2 \times T^4$
	$T = 5800$ K

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10(a)(i)	<u>total</u> power
	power radiated (by the star)
10(a)(ii)	standard candle has known luminosity
	radiant flux intensity measured by observer
	(distance calculated using) $F = L / 4\pi d^2$
10(b)(i)	luminosity $= 4\pi\sigma r^2 T^4$ $= 4\pi \times 5.67 \times 10^{-8} \times (6.96 \times 10^8)^2 \times 5780^4$
	$= 3.85 \times 10^{26}$ W
10(b)(ii)	$\lambda_{MAX} T$ = constant
	temperature $= (5780 \times 501) / 624$ $= 4640$ K

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10(a)	brighter star could be closer (to Earth)
	brighter star could have a greater luminosity (in the visible wavelengths)
10(b)	object with known luminosity
10(c)(i)	$\dfrac{660.9 - 656.3}{656.3} \approx \dfrac{v}{3.0 \times 10^8}$ leading to 2.1×10^6 m s^{-1}
10(c)(ii)	$v = H_o d$
	$d = 2.1 \times 10^6 / 2.3 \times 10^{-18}$ $= 9.1 \times 1023$ m
10(c)(iii)	wavelength has increased / light is redshifted
	star within galaxy is moving away / receding (from Earth)
	Universe is expanding