

Solutions

2.1 B For isotropic emission without absorption, flux follows an inverse-square relationship with distance. Observed brightness alone therefore cannot establish luminosity.

2.2 At three times the distance, $\text{flux} = 18/3^2 = 2$ units.

2.3 False. The Sun is not expected to become a supernova. Redshift can support cosmological expansion; it does not mean every nearby object must move away from every observer.

2.4 luminosity. luminosity means Total emitted power.

3.1 The fainter source is twice as far under inverse-square propagation and equal absorption. Different luminosity or absorption can also lower flux; flux alone is insufficient without calibration.