Astronomy 3 - Solution Set 0

1. **Explain the statement “The farther away we look in distance, the further back we look in time.”**

   Light travels at 300,000 km/s. It takes time for light to reach us from the distant parts of the Universe. The further these objects, the longer it takes time to get here. Therefore the light signals we are receiving now were emitted long ago and they carry information at a much earlier time.

2. **If sunlight takes 8 minutes to reach Earth, how long does moonlight take?**

   The distance to the Moon is 384,403 km. The speed of light is 300,000 km/s. It takes 1.28 seconds for the moonlight to reach the Earth.

3. **The star Belelgeuse is about 425 light years away. If it explodes tonight, a) we will know because it will be brighter than the full Moon in the sky, b) we will know because debris from the explosion will rain down on us from space, c) we won’t know about it until 425 years from now.**

   c)

4. **Suppose you wanted to reach Alpha Centauri in 100 years. a) How fast would you have to go in km/hr? b) How many times faster is the speed you found in a) than the speed of the fastest current spacecraft (around 50, 000 km/hr)?** Hint: you can find the distance to Alpha Centauri in your text book.

   The distance to Alpha Centauri is 41.5 trillion kilometres. There are 8766 hours in each year or 0.8766 million hr in 100 years. The speed needed is 41.5 trillion km / 0.8766 million hr = 47 million km /hr. This speed is nearly 1000 times faster than the fastest current space craft.