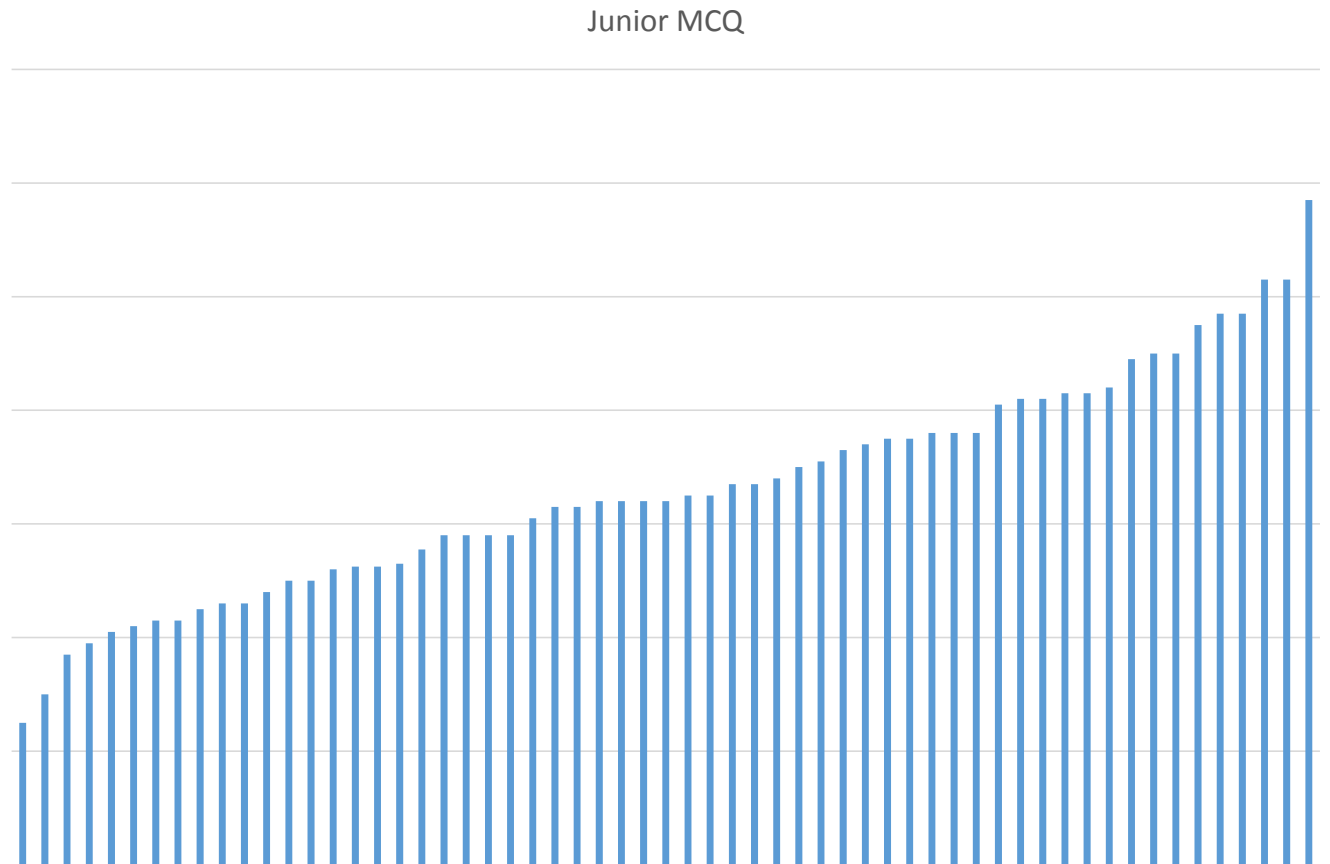


Day 2

Post Mortem

# MCQ : Junior [After Adjustment]

- Easiest: Q7 & Q33
- Most Kills: Q23
- Average: 66.09

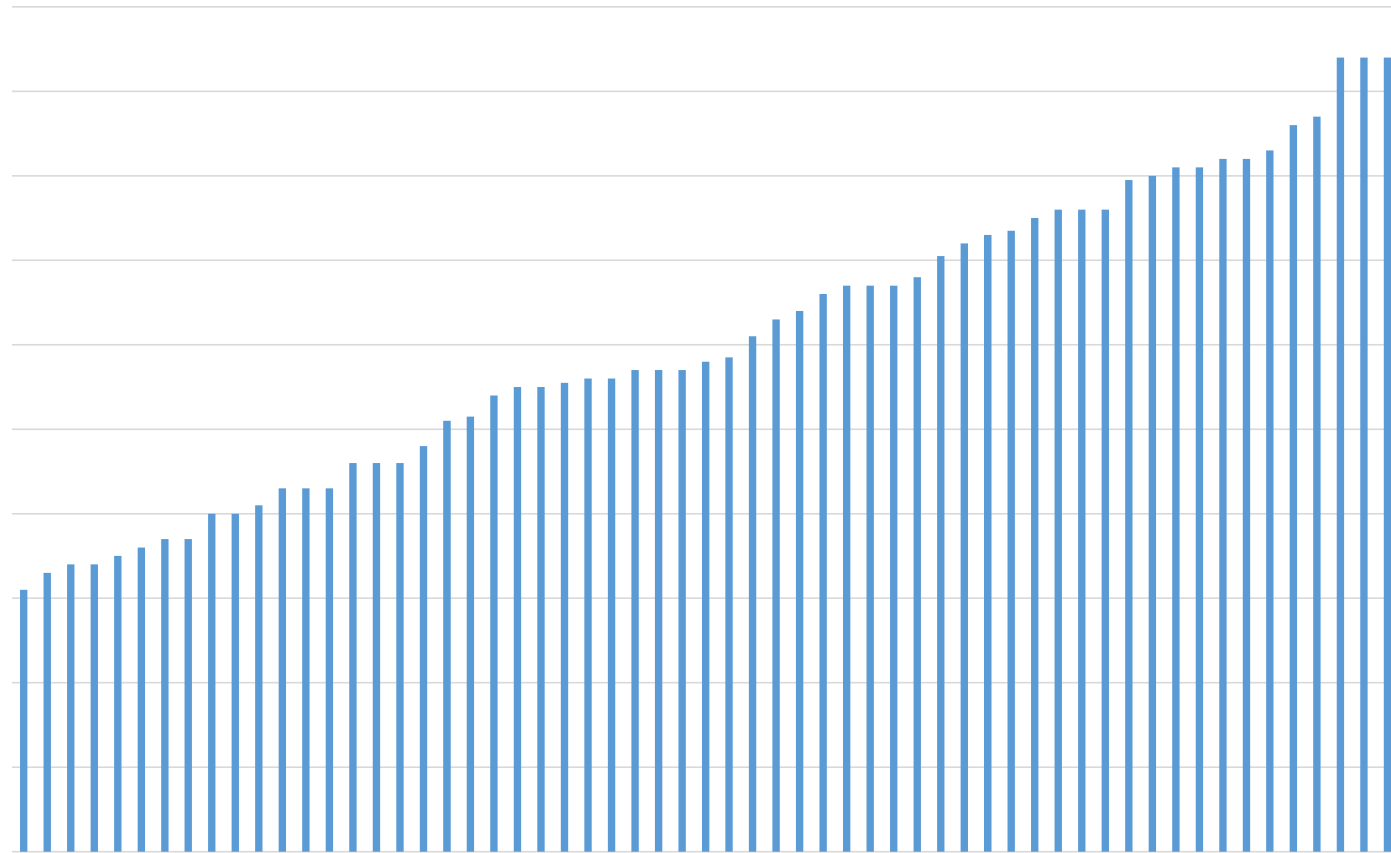


# Mcq : Senior [After Adjustment]

Senior Scores

- Easiest: Q20
- Most Kills : Q21
- Average : 60.55

NB: Tiebreak for  
Best Astronomer was  
used  
(most correct answers)



# General comments

- READ THE INSTRUCTIONS!!!!!!1
- CARE for your units
  - Or else
- The Universe WILL overwhelm you with info.
  - To do well, you need to learn to sieve out the essentials
  - A highlighter would probably do well in this regard
- DON'T OVERTHINK
  - Simplest tools are often the most powerful
  - There is often no need to use the most complicated formulae!

Junior DRQ

Sundial

# Stars and Cosmology

- The aim of this question is to test basic concepts and calculations.
- Many teams were lost from the start...
- Qualitative questions were well done.

# Astrobiology: Common mistakes

- Essay question : Rambling is BAD
- IT'S A DRQ FOR A REASON
  - Use the data!
- Make sure you write ONE final answer
- If you give answers without workings and your answers are wrong...
- Stars do not have a surface temperature of 7 degrees C!



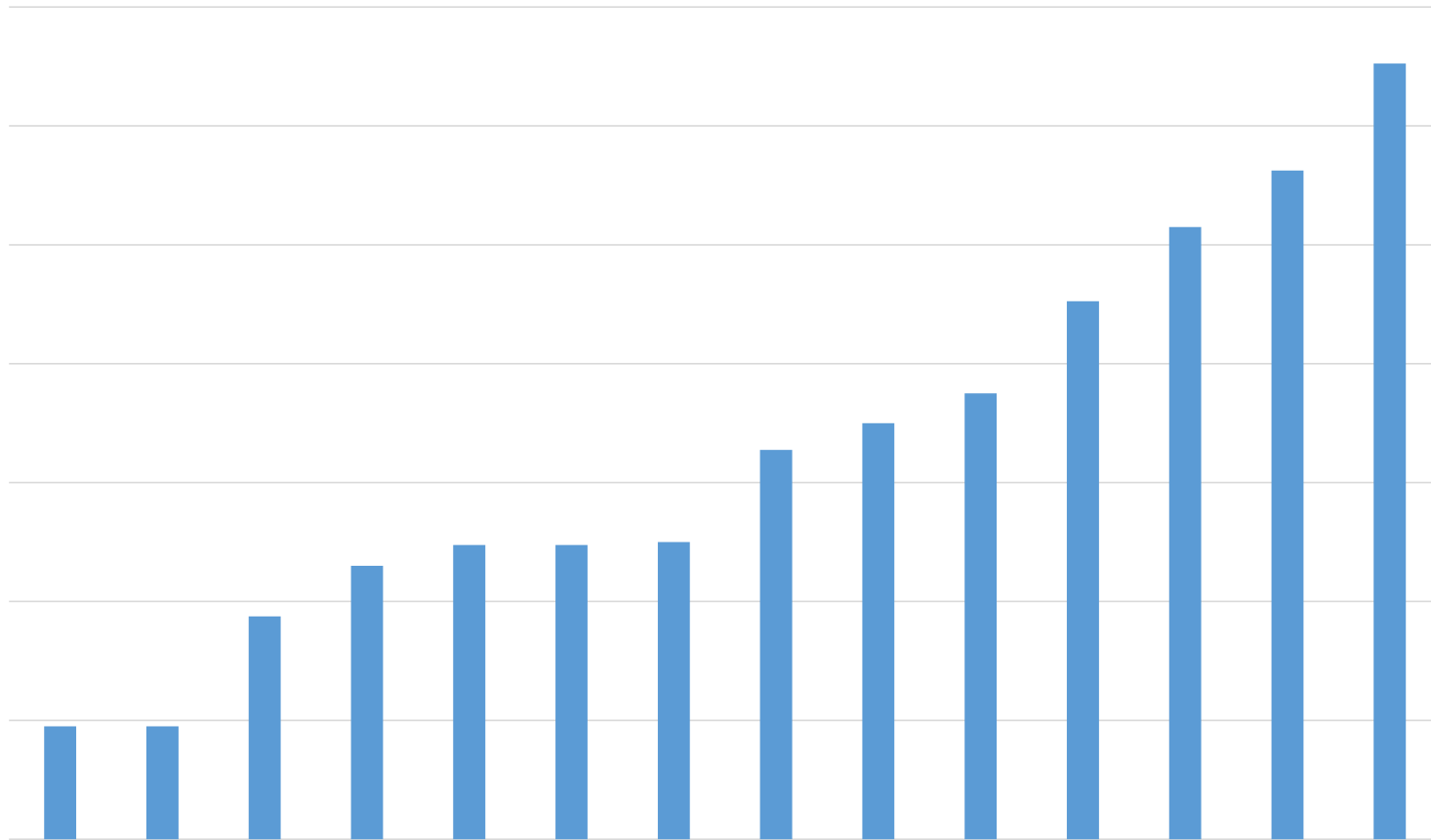
# Polaris and the Cosmic Distance Ladder

- If I give you a Doppler shift, that doesn't mean you have to use it!
- If you don't know the solar mass form of K3L, DON'T GUESS IT
- The Polaris system definitely does not have:
  - A mass of  $3.7 \times 10^{12}$  kg [less than the Moon or even a mountain]
  - A distance of  $10^{21}$  light years (or a mass of  $10^{31}$  solar masses)
    - If your main sequence star has a mass of  $10^{14}$  solar masses, something is SERIOUSLY off
- The arcsecond is NOT a measurement of time
  - Neither should you blindly apply your parallax formulae!

# Astronomy on Mars

- The Formula Book is there for a reason!
  - Sub in your values correctly!
  - Its aperture DIAMETER D, NOT DISTANCE!!!!
- There are no grids on the night sky...
  - Do not tell us to align a telescope by moving the axis x degrees from Deneb!
- Deep Sky Objects are NOT:
  - Planets
  - Single stars
  - Constellations
  - Meteor showers?!?

# Junior DRQ



Average = 32.77

Senior DRQ

# Lifetime of GCs

- Do not be deterred by mathematics.
  - Understand the logic behind the math!
  - This was the easiest question. Teams that bothered to plot graphs scored extremely well.
- This is a GC, not a single star!
  - Don't abuse the mass-luminosity relation!
- Key idea : the log of luminosity is related to magnitude.
  - Plot  $\log/\ln (t_{\text{evap}})$  against  $M_v$

# Orbital Mechanics

# A Clash of Two Stars

- The DRQ is structured in parts for a reason!
  - The mass of the silicon shell doesn't matter! Only the product does!
  - EM radiation from the shell  $\gg 10^{36}$  W
    - The shell is not in a vacuum! It absorbs energy from the outer layers
  - Power output of silicon shell  $\neq$  power output of core collapse!
- Simplicity is the best policy!
  - There is no need to invoke the chain rule!
- The formula book is there for a reason...
  - There's a formula that can help you!
  - And you're supposed to substitute the RIGHT values.
    - Why one would mistake Earth masses for Solar masses remains a mystery

# A Clash of Two Stars

- If you are supposed to give a process that drains energy from the shell, DO NOT name processes that ADD energy to it!
- Special relativity is not a magic elixir!
  - The speed of light is the same for all observers
  - The laws of physics are the same for all observers
- Like most clashes, bloodshed happens
  - THE DEATH STAR DIES.
  - Analyse everything in the same reference frame ALWAYS

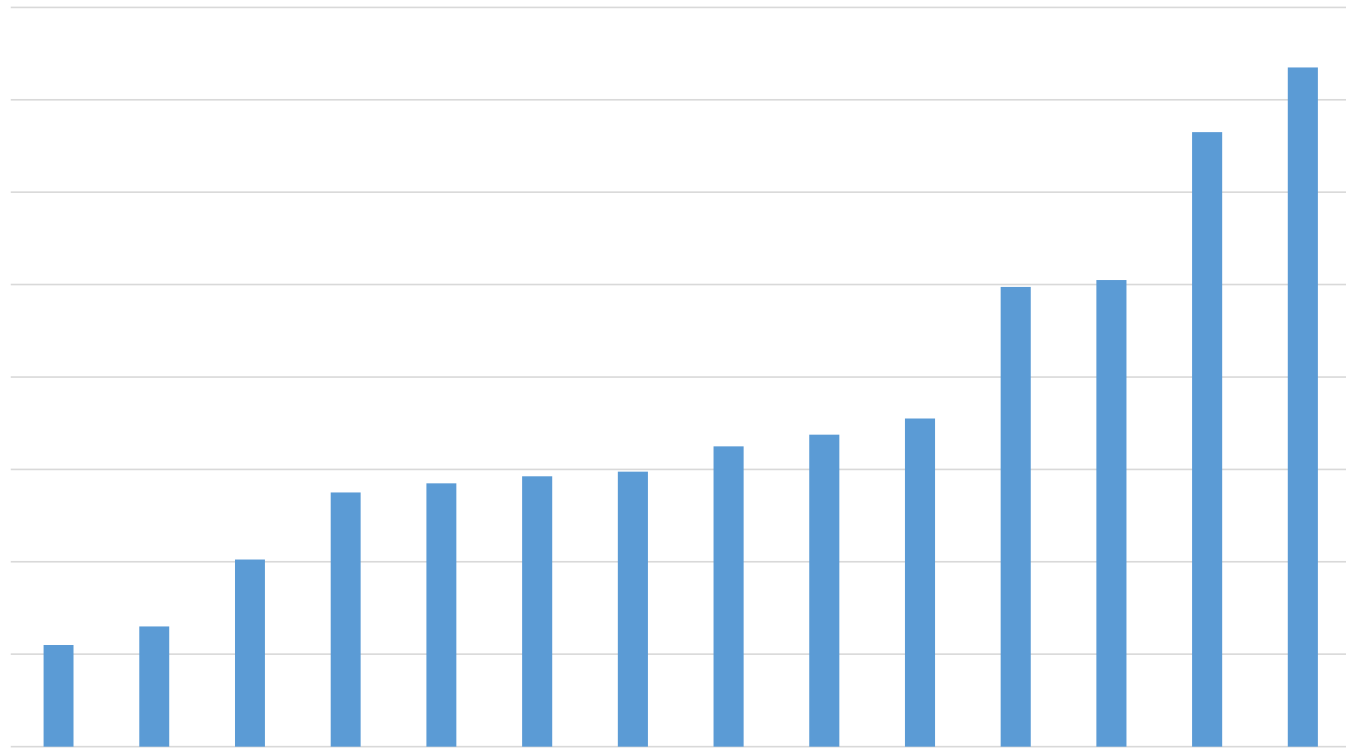


780 Days of Work

# M3

- Many had difficulty reading a color-magnitude diagram...
- Most were able to calculate the age of M3
  - In some way or another...
  - Please clearly explain your method!
- The last question was poorly done.
  - Most had no idea what to do!
  - Equate the prior orbital velocity to the final escape velocity to obtain a nice result.

# Senior DRQ



Average = 35.8

Obs

