Problem of the Week
Problem B and Solution
Bad Moon Rising

Problem

On May 26, 2021, a total lunar eclipse may be seen in many parts of the world. The moon will gradually become darker and then take on a rusty red colour for only 14 minutes and 30 seconds.

Below is data on this and other recent total lunar eclipses.

Month and Year	Duration (in minutes)	Month and Year	Duration (in minutes)	Month and Year	Duration (in minutes)
May 2003	52	Feb 2008	50	Apr 2015	12
Nov 2003	24	Dec 2010	74	Sept 2015	72
May 2004	76	Jun 2011	100	Jan 2018	76
Oct 2004	82	Dec 2011	52	Jul 2018	104
Mar 2007	74	Apr 2014	78	Jan 2019	62
Aug 2007	90	Oct 2014	60	May 2021	14.5

a) What are the mean and median durations of these 18 total lunar eclipses? (Since there is an even number of eclipses listed, recall that the median is the average of the middle two numbers when the data is arranged in order.)

b) For one of the three columns of given data, create a bar graph showing the durations of the total eclipses in that column.

c) Look up the dates and durations of the next four total lunar eclipses.

Solution

a) To calculate the mean duration, we first need to add up all the values from the table. When we do this, we get 1152.5 minutes. Then we divide this sum by the number of values in the table, which is 18. So the mean duration is $1152.5 \div 18 \approx 64.03$, or approximately 64 minutes.
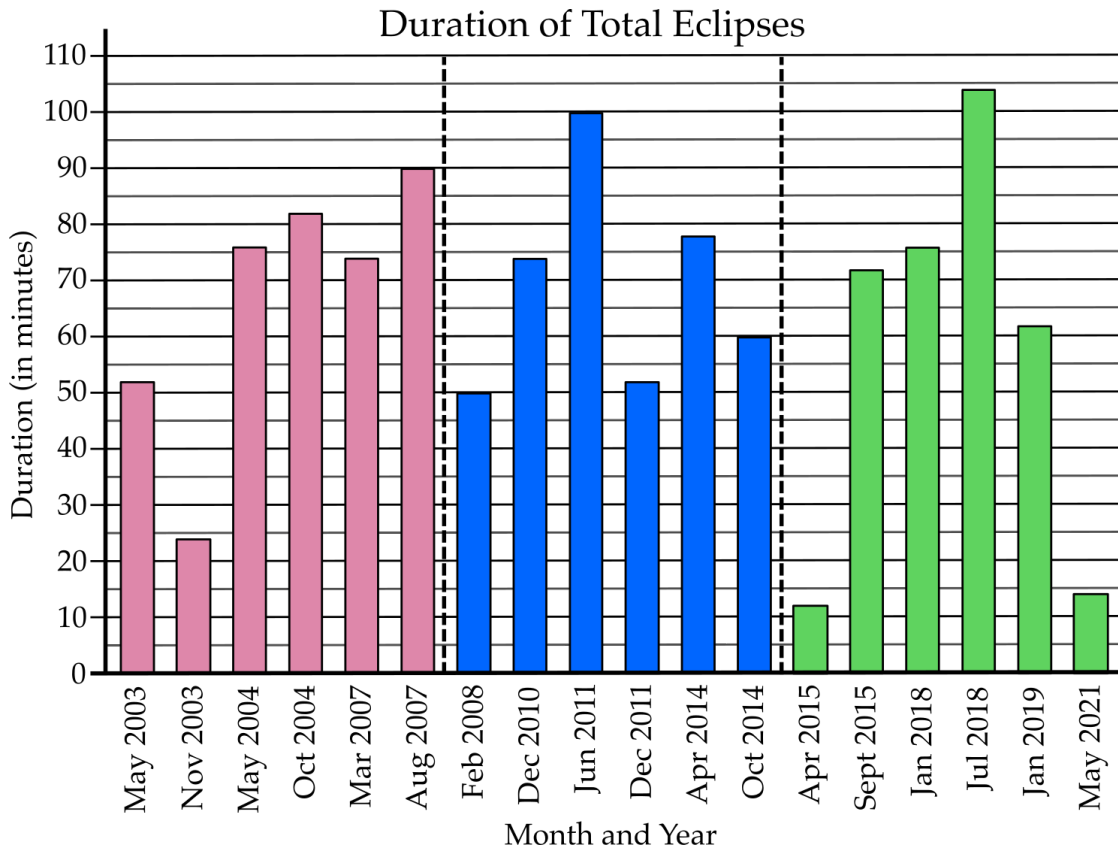
To calculate the median duration, we can start by writing all the durations in order from smallest to largest.

$$12, 14.5, 24, 50, 52, 52, 60, 62, 72, 74, 74, 76, 76, 78, 82, 90, 100, 104$$

The middle two numbers are 72 and 74, so the median duration is the average of these two numbers, which is 73. If the average isn't immediately obvious, you can calculate it by adding 72 and 74 together, and then dividing the result by 2 to get 73.

b) Below is a bar graph for all the given data. (Check your chosen column.)

Duration of Total Eclipses

c) According to timeanddate.com, the next four total lunar eclipses and their durations are:

May 16, 2022	85 minutes
November 8, 2022	85 minutes
March 14, 2025	65 minutes
September 7, 2025	82 minutes