

Week 1/2  
Term 3  
2020



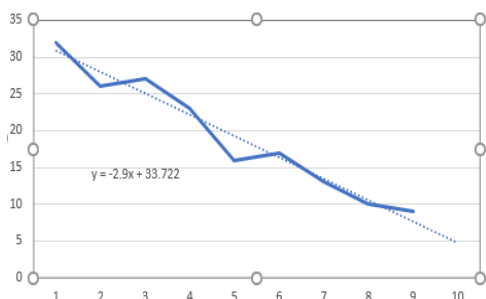
# HAWKER COLLEGE

Engage | Inspire | Achieve

Learning Brief

MA4

## Goals



This week:

- construct time series plots
- describe time series plots by identifying features such as trend (long term direction), seasonality (systematic, calendar-related movements), and irregular fluctuations (unsystematic, short term fluctuations), and recognise when there are outliers; for example, one-off unanticipated events
- smooth time series data by using a simple moving average, including the use of spreadsheets to implement this process
- calculate seasonal indices by using the average percentage method
- fit a least-squares line to model long-term trends in time series data

## Theoretical Components

### Resources:

For this week the theory work is in the *PDF file: Week 1 and 2 Notes & Exercises*

Finding the linear regression equation using Google Sheets:

<https://www.youtube.com/watch?v=0DuvyOKAc1I>

An interesting exercise in using a trend line:

<https://www.khanacademy.org/math/probability/scatterplots/a1/estimating-trend-lines/v/smoking-1945-extrapolation>

An introduction to smoothing using the mean. Note: we do not use 4 point mean or median smoothing. You can skip these sections:

<https://www.youtube.com/watch?v=U0dF8uJs3mE>

### Knowledge Checklist

- Time series
- Trends, outliers, cycles
- Secular, seasonal, cyclic, random
- Trend line
- Forecasting
- Linear regression equation
- Smoothing out fluctuations
- Moving-average smoothing
- Predictions
- Median point smoothing
- Using a spreadsheet

## Practical Components

There are questions to be answered in the booklet *Week 1 and 2 Notes & Exercises*

## Investigation

On HawkerMaths and attached to this week's work

On-line Quiz

Mathspace Task