

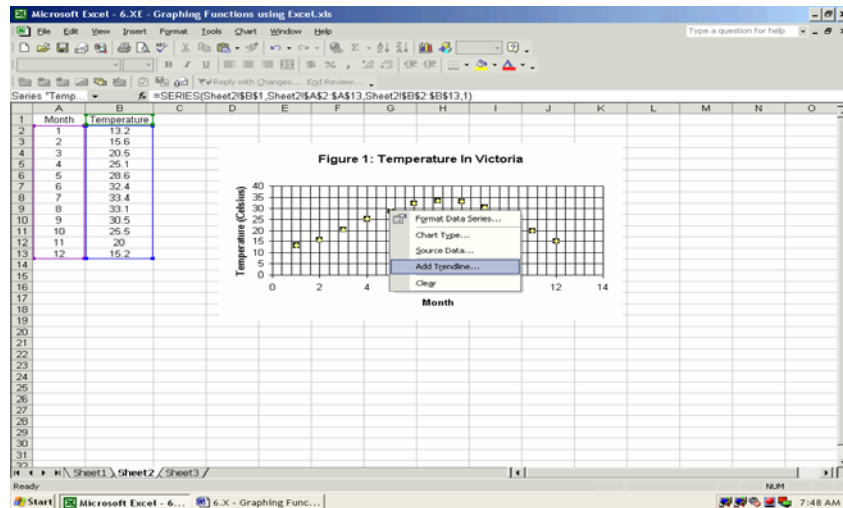
Example 2: Graphing data and performing a regression using MS Excel

Consider the seasonal temperature change example from lesson 6.2.

The average temperature in any location changes with the season. The data below records the average temperatures for Victoria, B.C. over a 12 month period.

Month	1	2	3	4	5	6	7	8	9	10	11	12
Temperature	13.2	15.6	20.5	25.1	28.6	32.4	33.4	33.1	30.5	25.5	20	15.2

- Open up MS Excel and enter the data under columns A and B
- Highlight the data and using the chart wizard and construct a scatter plot. This time select the time with the points only (i.e. no connection line)
- Again go through various screen to tailor the graph to your preferences.
- Add a **trend line** by right clicking on the data. Unfortunately, this function is best modelled using a periodic function which the computer will not do. So we will have to settle with a polynomial function (maybe 3rd degree?)



- If you right click on the trend line, go to options and select the option of displaying the **equation and r-value**.
- The final graph can be copied and pasted as an object into other programs like MS Word or ?. See below for our two graphs.

Figure 1: Temperature In Victoria

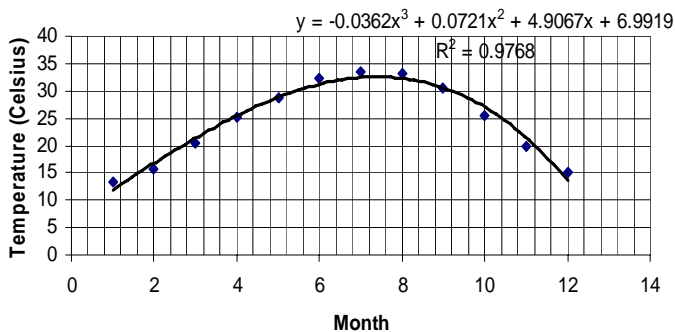


Figure 1: Gonzo's Flight



6.X – Graphing Functions on MS Excel Practice Questions

Graph questions the functions in #1 - 5 and make mental notes on the changes needed to your x-values to adequately represent the graph in MS Excel.

1. A catheterization is a special test used to find out how well heart muscles and valves are working. In a normal heart, the concentration of the dye is given by the function $g(x) = -0.006x^4 + 0.14x^3 - 0.053x^2 + 1.79x$, where x is the time in seconds.
2. A sphere with radius 1 is contained within a cone. The volume of the cone as a function of the base radius, r , of the cone is given by $V(r) = \frac{2\pi r^4}{3(r^2 - 1)}$
3. A train traveling at 60mph for a given amount of time, t_1 , and then at 40mph for 8 hours can be modeled by the function $V = \frac{60t_1 + 320}{t_1 + 8}$.
4. A rectangular piece of paper with perimeter 30cm is folded into a triangular prism with equilateral triangle ends of length x . The volume of the prism is given by $V(x) = \left(\frac{\sqrt{3}}{4}x^2\right)(15 - 3x)$.
5. A rectangular piece of tin with perimeter 50cm is rolled into a cylinder with open ends. The volume of the cylinder as a function of x , the circumference of the circular base, is given by $V(x) = \frac{x^2(25 - x)}{4\pi}$.

Graph the data in questions #6 & 7. Add a trend line and come up with best model.

6. Population records in a small town.

Year	1981	1982	1983	1984	1985	1986
Population	4031	2008	3937	3824	3675	3496

7. Tire pressure in a leaking tire

Time (minutes)	0	5	10	15	20	25	30	35	40	45
Pressure (kPa)	400	335	295	255	255	195	170	150	135	115

Answers 6. cubic $P(y) = -94y^3 + 557857y^2 - 1106333831y + 731354210000$ or $P(y) = -128y^3 + 980y^2 - 1780y + 3777$ if use y as years after 1980 7) exponential $P(t) = 394(0.973158)^t - 0.995$ or $P(t) = 394(0.872)^{t/5} - 0.995$