

SPINOFFS

Spinoffs are relatively short learning modules inspired by the LTAs. They can be easily implemented to support student learning in courses ranging from prealgebra through calculus. The Spinoffs typically give students an opportunity to use mathematics in a real world context.

LTA - SPINOFF 20A

What's the Equation?

LTA - SPINOFF 20B

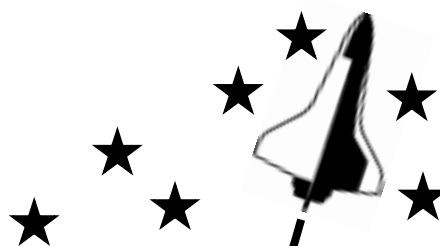
What's My Curve?

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SPINOFF 20B

What's My Curve?

The following data was obtained over a 10 hour period from a stand of wheat plants in the Biomass Production Chamber: Initially, during the first 0.8 hours, CO₂ was deliberately added to the chamber and then shut off so that scientists could track the CO₂ “drawdown” from photosynthesis.

Carbon Dioxide Concentration (ppm) over Time (hours)¹

Time	PPM	Time	PPM
0.2	850	5.2	875
0.4	850	5.4	750
0.6	1200	5.6	719
0.8	2375	5.8	672
1.0	2313	6.0	609
1.2	2250	6.2	578
1.4	2188	6.4	547
1.6	2125	6.6	469
1.8	2000	6.8	438
2.0	1938	7.0	406
2.2	1844	7.2	359
2.4	1750	7.4	312
2.6	1688	7.6	281
2.8	1625	7.8	250
3.0	1563	8.0	234
3.2	1500	8.2	219
3.4	1438	8.4	203
3.6	1344	8.6	188
3.8	1281	8.8	156
4.0	1219	9.0	172
4.2	1156	9.2	156
4.4	1094	9.4	156
4.6	1031	9.6	125
4.8	969	9.8	125
5.0	938	10.0	125

- 1) Use a graphing calculator or a spreadsheet to make a scatterplot of the data.
2. a) Use your calculator or computer to find the equation of the regression line (the “best fitting” line) and the value of the correlation coefficient, r , for this data.
b) Graph this line on the same coordinate system as the scatterplot.

- 3) An exponential curve may fit the data better than a line.
 - a) Use your calculator or computer to find the exponential regression function that “fits” the data best and the corresponding value of r .
 - b) Graph the exponential regression function on the same coordinate system as the scatterplot.
- 4) Compare your results from Exercises 2 and 3, and draw a conclusion about whether a line or an exponential curve fits the data best. Justify your answer.

1. Carbon Dioxide and Water Exchange Rates by a Wheat Crop in NASA’s Biomass Production Chamber: Results from an 86-Day Study (January to April 1989), by R. M. Wheeler and J. C. Sager, NASA Technical Memorandum TM 102788, January 1990.