

# Managing a gas field.

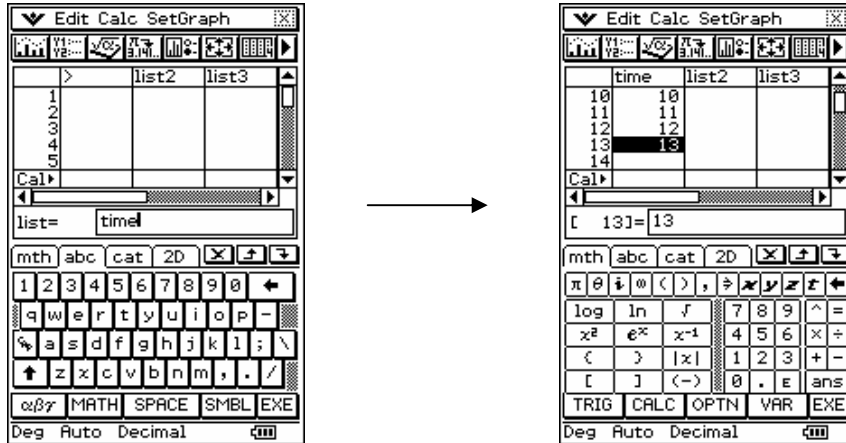
## Checkpoints



### Activity 1: Viewing the gas flow data.

Parts B and C – Data entry



The input of headings and data should look like for *time*...

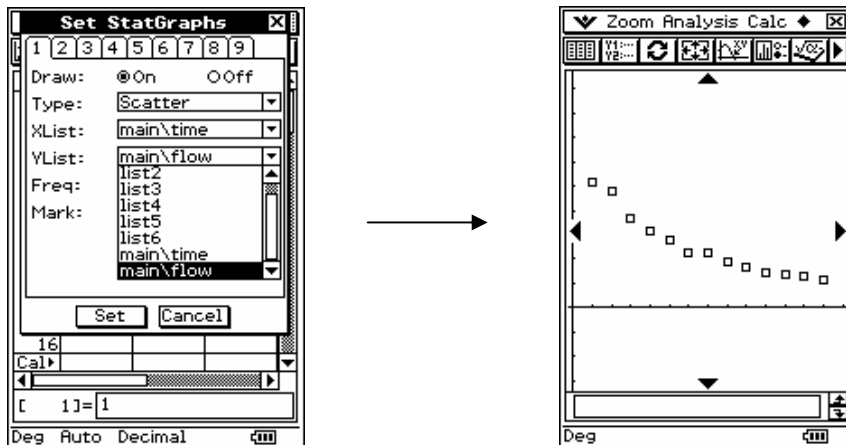


... and similarly for *flow*...



Part D – Drawing a graph.

Tapping  (or tapping SetGraph and then Setting...) allows us to set the graph up appropriately. The graph is then drawn by tapping .



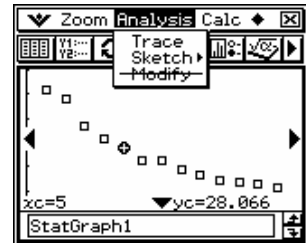
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## Checkpoints



Part E – Tracing through the graph.

Tap on Analysis : Trace or tap then press and .



### Answers

1. It falls/decreases in a fairly consistent manner, quickly at first, then more slowly as time passes
2. Yes, it looks like it will keep falling until it falls below 5 MMscf/day. It might 'level off' below it reaches 5 MMscf/day, but in the context of gas extraction this is unlikely.
3. In around 6 months time (i.e. December 1999) is a very rough estimate.



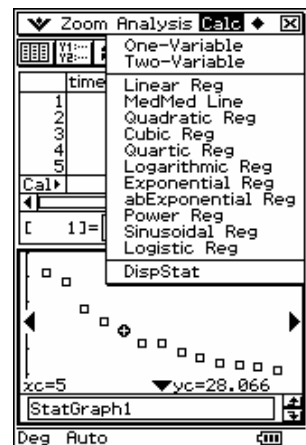
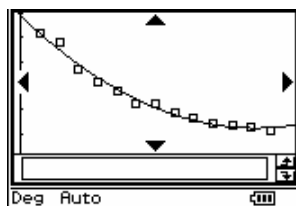
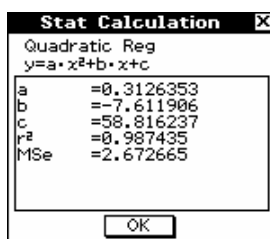
### Activity 2: Developing a model for the gas flow data.



Tap Calc to see some options

### Answers

1. Investigating a quadratic model, for example, by tapping Quadratic Reg provides the following model



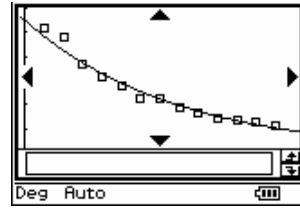
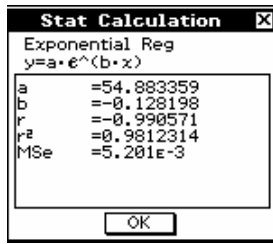
We can see that the model, in general, fits well but clearly is about to 'turn' and start increasing towards the end of the time period. This makes extrapolation to find when the flow falls below 5 MMscf/day impossible, as a quadratic model says that it never will, but the scatter plot and common sense suggest otherwise.

Looking for a model type that decays to a flow of zero, two algebraic model types could be considered, a *simple exponential* model and a *power* model.

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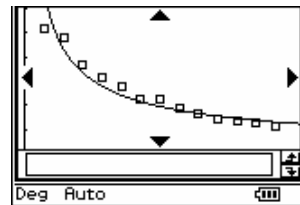
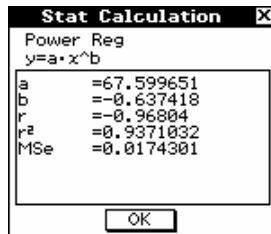
## Checkpoints

Investigating a simple exponential model by tapping on Exponential Reg,



We can see that an exponential model fits the data well (after the first few points). It fits particularly well as time passes, making it suitable for the extrapolation that we require.

Investigating the power model by tapping on Power Reg gives,



This shows that this type of model fits the shape of the data less well.

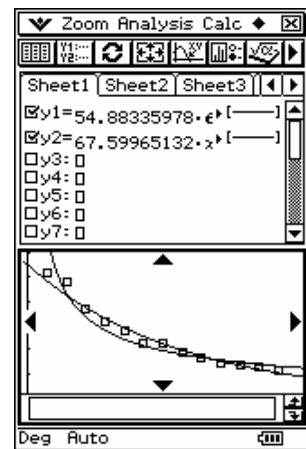
If a visual comparison of two or more models is required

it is best to copy their formulae into rows of



tap on and check that they are selected, and then tap

on to add these graphs to your scatter plot.



2.

With our chosen model stored, we can work with it in

, using the full range of graphical tools that are available in that mode.

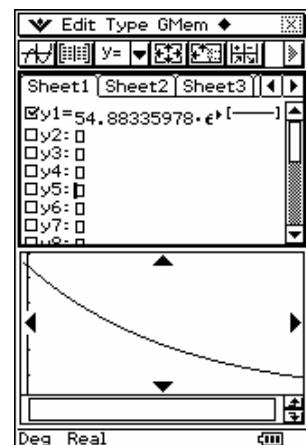
The view window settings from the last graph drawn,

the scatter plot drawn in mode, are unchanged by

changing modes. All we need to do to graph the model is

make sure that it is selected (tap the box to tick it) then

tap , getting this result

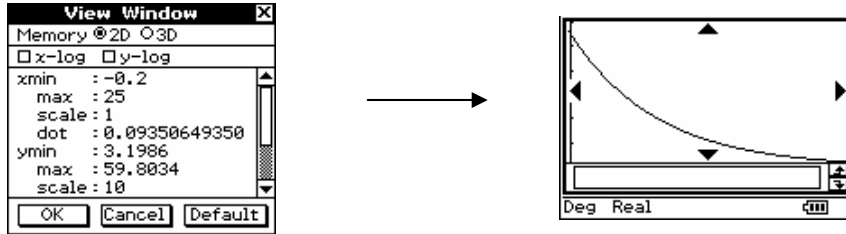


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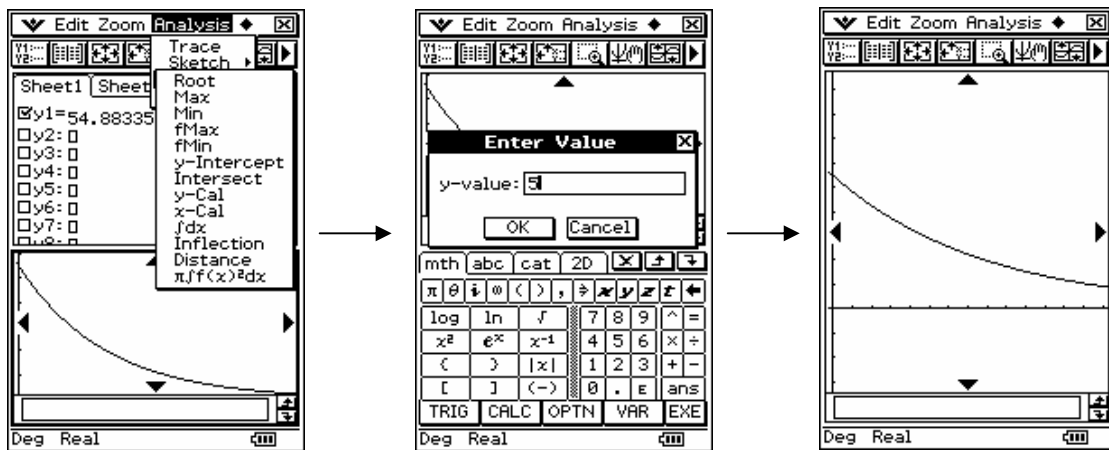
The extrapolation that we wish to do, to find when the model predicts that the gas flow falls below 5 MMscf/day, is equivalent to extending the graph to the right.

By tapping  we can change the X max up to 25 months.



To find when the graph of the flow falls below 5 MMscf/day we can do an x calculation. Tap Analysis : G-Solve : x-Cal then enter the value y=5.

The screen sequence looks like this



This provides the crucial x value of 18.7, corresponding to a time of November 1999 when the sixth well will be required.

If, when performing an x-cal the ClassPad 300 responds with Not Found then the y value entered does not occur in the current view window and you may need to widen your view!

