

Trig 4.8

Write polynomial functions to model data
Use polynomial functions to interpret data

parent graph

end behavior

odd/even functions

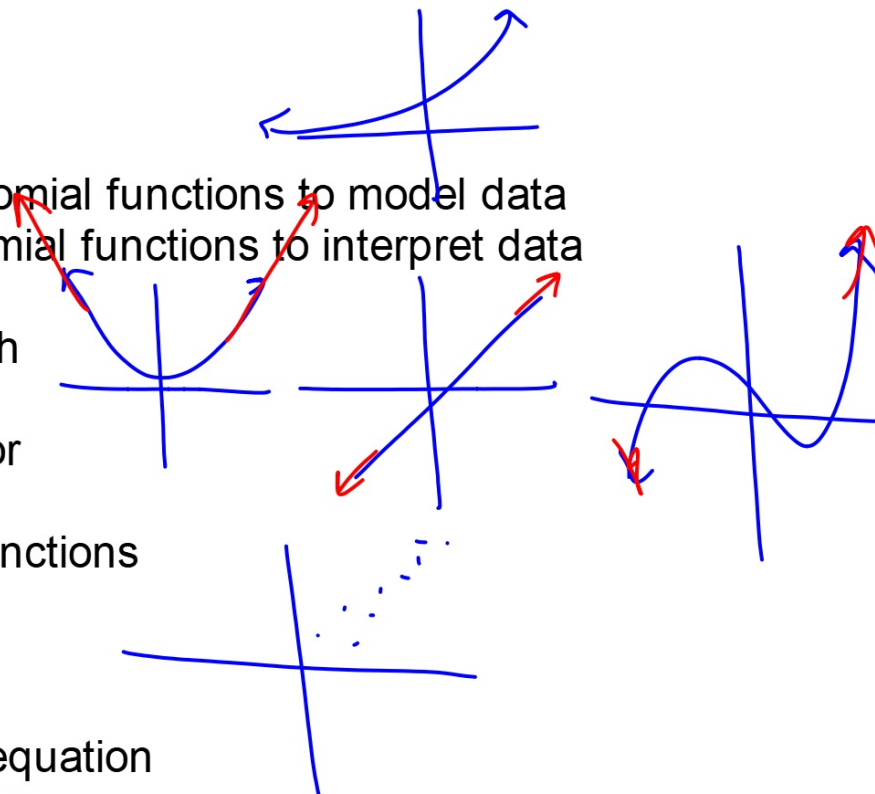
scatterplot

regression equation

linear reg.

graphing calculators

Desmos card sort

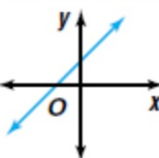
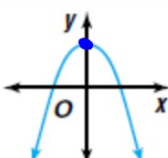
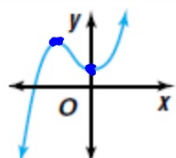
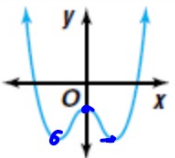


Degree:

x^2

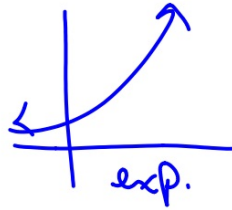
x^3

x^4

Function	Linear $y = ax + b$	Quadratic $y = ax^2 + bx + c$	Cubic $y = ax^3 + bx^2 + cx + d$	Quartic $y = ax^4 + bx^3 + cx^2 + dx + e$
Typical Graph				
Direction Changes	0	1	2	3

turning points

$n-1$

 $y = e^x$

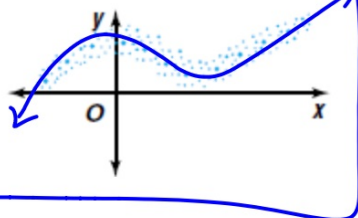
exp.

Desmos cardsort
Go to: student.desmos.com
Class code: 77QTFH

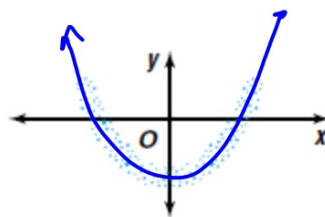
This is one reason we learned about parent graphs!

- 1** Determine the type of polynomial function that could be used to represent the data in each scatter plot.

a.

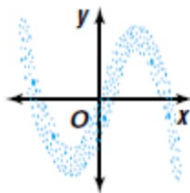


b.

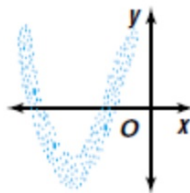


Determine the type of polynomial function that could be used to represent the data in scatter plot.

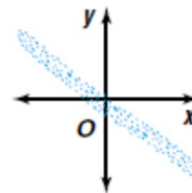
8.



9.



10.



Graphing calculator startup process

Power on (duh)

Clear home screen (2nd Quit)

Plots off (2nd y=)

Clear functions (y=)

Clear stat lists (stat>edit>L₁>clear)

- 2 Use a graphing calculator to write a polynomial function to model the set of data.

L1	x	-1	-0.5	0	0.5	1	1.5	2	2.5	3	3.5	4
L2	f(x)	-10	-6.4	-5	-5.1	-6	-6.9	-7	-5.6	-2	4.6	15

Enter data

Window & graph

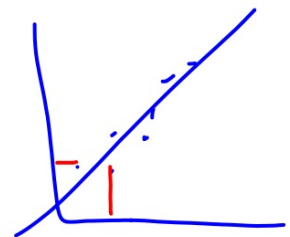
Which model?

Write the function

Note r and/or r^2

$$y = x^3 - 3.002x^2 + 1.005x - 5.002$$

$$r = 0.999795$$



Use a graphing calculator to write a polynomial function to model each set of data.

5.

x	-3.5	-3	-2.5	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
$f(x)$	103	32	-1	-11	-9	-2	3	5	4	4	12	37

linreg L_1, L_2 , vars
yvars
function
y,



Linear $y = 0.487x + 57.680$

0.979

Occam's Razor

$$\text{pop} = 0.487(\text{year}) + 57.680$$

7. **Population** The percent of the United States population living in metropolitan areas has increased since 1950.

Year	0	10	20	30	40	46
1950	1960	1970	1980	1990	1996	
Population living in metropolitan areas	56.1%	63%	68.6%	74.8%	74.8%	79.9%

Occam's ?

85

Source: American Demographics

Cubic $1.231 \times 10^{-4}x^3 - 0.014x^2 + 0.879x + 55.902$

a. Write a model that relates the percent as a function of the number of years since 1950.

$r = 0.989$

b. Use the model to predict the percent of the population that will be living in metropolitan areas in 2010. 60

c. Use the model to predict what year will have 85% of the population living in metropolitan areas. 2006

Not just x and y anymore: Your equation reflects what the data is about

9-21082 } either
WB all }