Trig 4.8

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

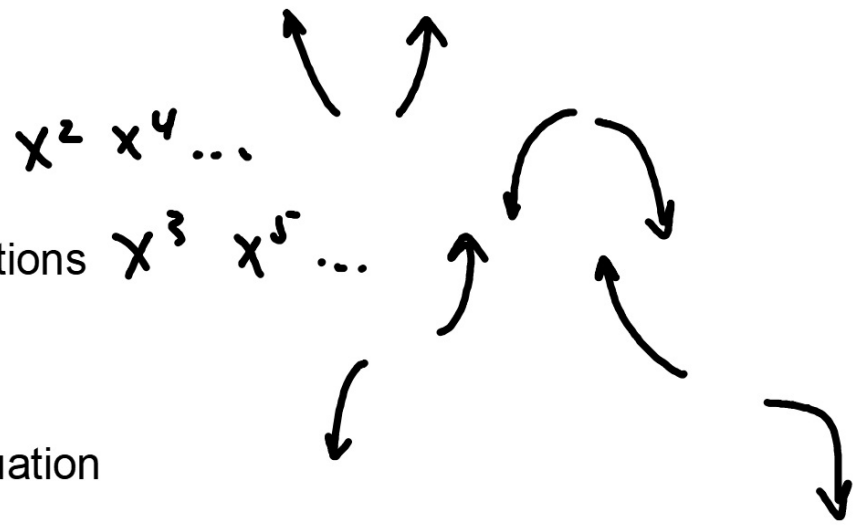
parent graph

end behavior x^2 x^4 ...

odd/even functions x^3 x^5 ...

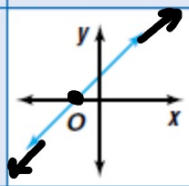
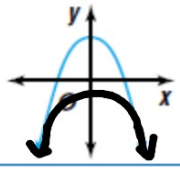
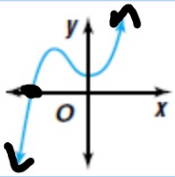
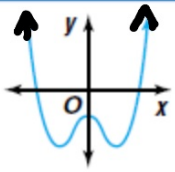
scatterplot

regression equation



graphing calculators
Desmos card sort

Degree:

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

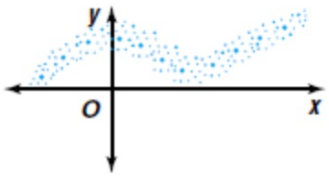
turning points

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

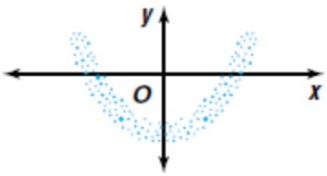
This is one reason we learned about parent graphs!

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

a.

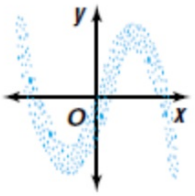


b.

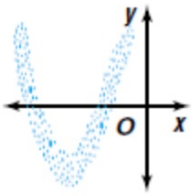


Determine the type of polynomial function that could be used to represent the data in scatter plot.

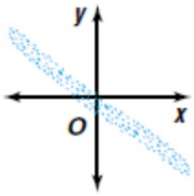
8.



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>L_1>clear)

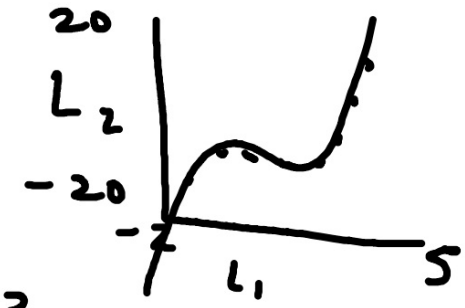
4.8 9-17 odd

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

L1
L2

x	−1	−0.5	0	0.5	1	1.5	2	2.5	3	3.5	4
$f(x)$	−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



$y = 0.96x^3 - 2.85x^2 + 1.02x - 5.35$

$R^2 = 0.997$ $r = 0.999$

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

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

Year	1950	1960	1970	1980	1990	1996
Population living in metropolitan areas	56.1%	63%	68.6%	74.8%	74.8%	79.9%

Source: *American Demographics*

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

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

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

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