Trig 4.8

Quiz Wed. 4.7-4.8

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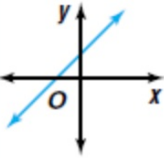Use polynomial functions to interpret data

parent graph
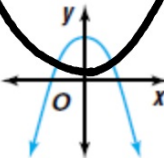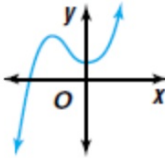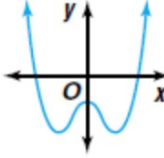
end behavior

odd/even functions

scatterplot

regression equation

graphing calculators

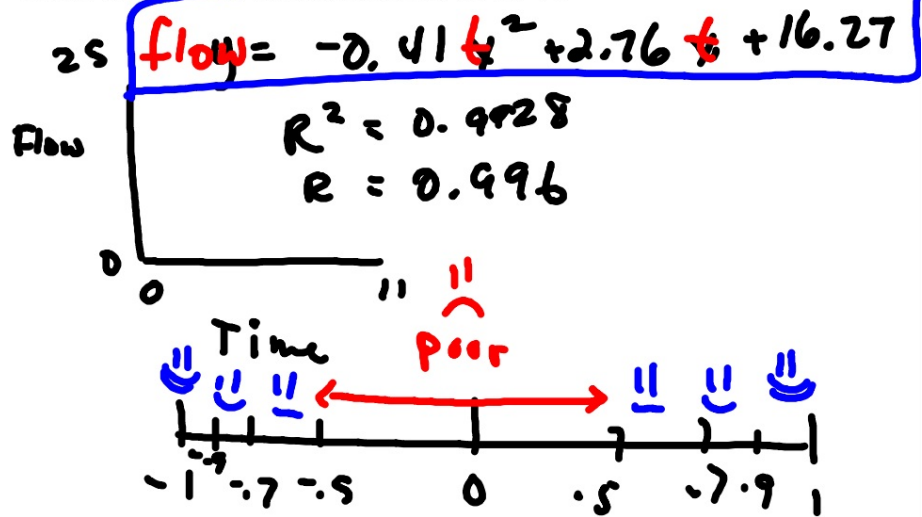| Function	Linear $y = ax + b$	Quadratic $y = ax^2 + bx + c$	Cubic $y = ax^3 + bx^2 + cx + d$	Quartic $y = ax^4 + bx^3 + cx^2 + dx + e$
Typical Graph				
Direction Changes	0	1	2	3

What is the independent variable?
Dependent variable?

Example 2 An oil tanker collides with another ship and starts leaking oil. The Coast Guard measures the rate of flow of oil from the tanker and obtains the data shown in the table. Use a graphing calculator to write a polynomial function to model the set of data.

x y

L_1 Time (hours)	L_2 Flow rate (100s of liters per hour)
1	18.0
2	20.5
3	21.3
4	21.1
5	19.9
6	17.8
7	15.9
8	11.3
9	7.6
10	3.7

When the data is about something, your answer should reflect that.
Also note and comment on R or R²

$$\text{flow} = -0.4114 t^2 + 2.76 t + 16.27$$

$$R^2 = 0.9728$$
$$R = 0.996$$

Flow

Time

Poor

Write a polynomial function to model each set of data.

1. The farther a planet is from the Sun, the longer it takes to complete an orbit.

$r = 0.99$

Distance (AU)	0.39	0.72	1.00	1.49	5.19	9.51	19.1	30.0	39.3
Period (days)	88	225	365	687	4344	10,775	30,681	60,267	90,582

Source: Astronomy: Fundamentals and Frontiers, by Jastrow, Robert, and Malcolm H. Thompson.

100,000
per.

$\text{days} = 484.51 (1.174)^{\text{dist.}}$

$r = 0.89$ ⇩

strong pos.

Comment on r/r²

0   dist   50

3. The temperature of Earth's atmosphere varies with altitude.

Altitude (km)	0	10	20	30	40	50	60	70	80	90
Temperature (K)	293	228	217	235	254	269	244	207	178	178

Source: Living in the Environment, by Miller G. Tyler.

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r/r²