

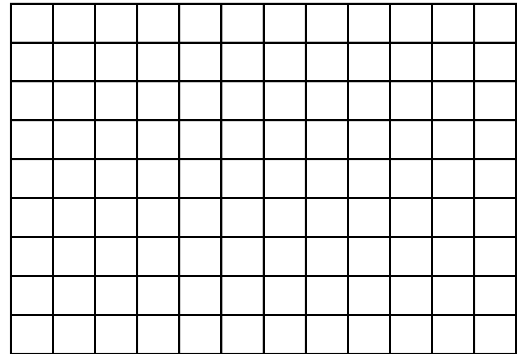
**Precalculus Unit 3: 3.3 Homework**  
**Exploring Data: Linear, Quadratic, and Cubic Models**

1. The table shows the normal monthly precipitation  $P$  for San Francisco, California.  
 (Source: U.S. National Oceanic and Atmospheric Administration)



Month	Precipitation, $P$
January	4.45
February	4.01
March	3.26
April	1.17
May	0.38
June	0.11
July	0.03
August	0.07
September	0.20
October	1.40
November	2.49
December	2.89

- a.) Use your calculator to create a scatter plot of the data. Let  $t = 1$  correspond to January. Draw a sketch of the scatter plot below.



- b.) Use your calculator to find a quadratic model for this data. Sketch your model on the graph above. Record your model below. What is the  $R^2$  value?

Model:

$R^2$ :

- c.) According to your model, what is the normal rainfall amount for October?

**BOATING** The data in the table give the average speed  $y$  (in knots) of the *Trident* motor yacht for several different engine speeds  $x$  (in hundreds of revolutions per minute, or RPMs).

- Find a polynomial model for the data.
- Estimate the average speed of the *Trident* for an engine speed of 2400 RPMs.
- What engine speed produces a boat speed of 14 knots?

Engine speed, $x$	9	11	13	15	17	19	21.5
Boat speed, $y$	6.43	7.61	8.82	9.86	10.88	12.36	15.24

2.