

LESSON 5.4 Skills Practice

Name _____ Date _____

Modeling Gig
Modeling Polynomial Data

Problem Set

Use Data Sets A through F to solve the following problems.

A: The table shows the average share price of WXY company stock since 1994.

Time Since 1994 (years)	WXY Share Price (dollars)
1	5
3	10
5	25
7	15
9	15
11	40
13	100
15	150
17	300
19	500

B: The table shows the number of less than 100-mile trips in the US over the Thanksgiving holiday.

Time Since Monday before Thanksgiving (days)	Number of Less Than 100-Mile Trips (millions)
1	12
2	19
3	27
4	23
5	24
6	18

C: The table shows the relationship between J. Company's advertising spending and their profit.

Advertising Spending (hundred dollars)	Profit (ten thousand dollars)
0	2
2	6
6	14
10	18
12	20
14	16
16	12
18	8
20	4

D: The table shows the number of tons of apples harvested per acre since 1990.

Time Since 1990 (years)	Tons of Apples (thousands)
1	4.9
3	5.4
5	5.2
7	5.4
9	5.9
11	6.3
13	7.1
15	9.7



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E: The table shows the average home mortgage interest rate since 1999.

Time Since 1999 (years)	Interest Rate (%)
0	6.5
1	8.5
2	7.0
3	6.5
4	6.0
5	5.5
6	6.0
7	7.0
8	5.0
9	4.5

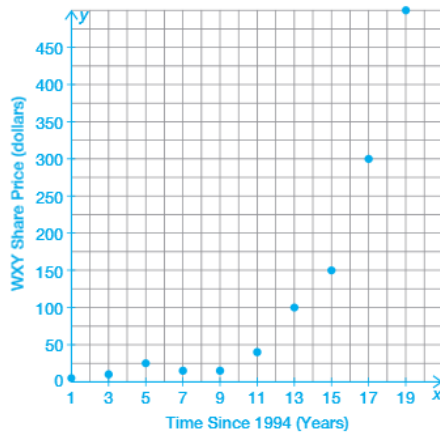
F: The table shows the relationship between shell length of a turtle and number of eggs laid per clutch.

Shell Length (millimeters)	Number of Eggs Laid per Clutch
285	3
290	7
300	9
305	10
310	10
315	9
320	7
330	5
335	2

Create a scatter plot for the data.

1. Data Set A

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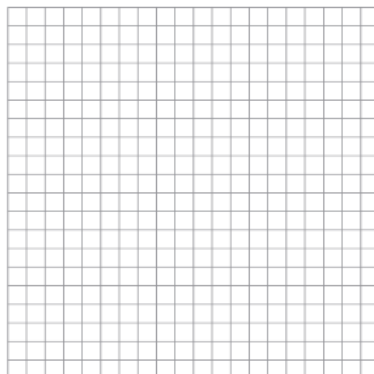
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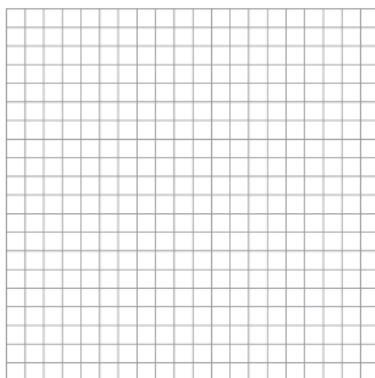
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2. Data Set B



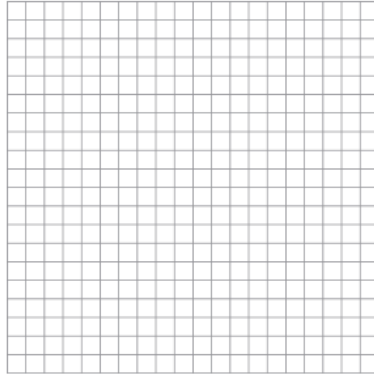
3. Data Set C



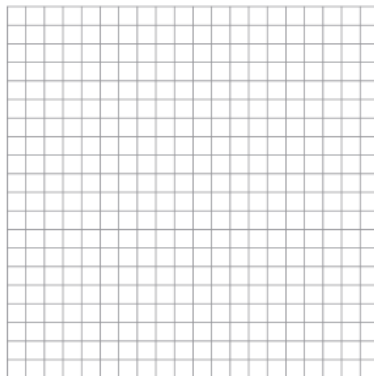
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4. Data Set D



5. Data Set E



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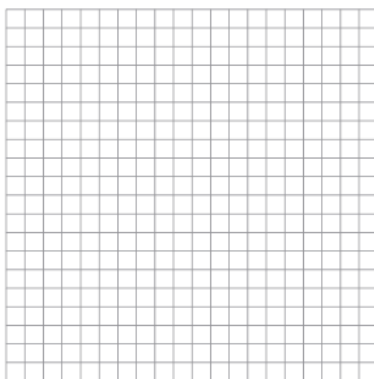
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6. Data Set F



Analyze each data set and its scatter plot and describe the polynomial function that best models the data. Explain your reasoning.

7. Data Set A: **The data increases, decreases, then increases again. A cubic function models the data.**



8. Data Set B:

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9. Data Set C:

10. Data Set D:

11. Data Set E:

12. Data Set F:

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Use a graphing calculator to determine the regression equation that best models the data. Round decimals to the nearest thousandth.

13. Data Set A: **The function $y = 0.229x^3 - 4.106x^2 + 22.496x - 18.003$ models the data.**

14. Data Set B:

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15. Data Set C:

16. Data Set D:

17. Data Set E:

18. Data Set F:

Use the regression equations from Problems 13 through 18 to answer each question.

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19. Susan bought 25 shares of WXY stock in 2006. How much money did she pay for her shares?

In the year 2006, 25 shares cost \$56.40. I used the table of values to determine the output value for the input $x = 12$.

20. Approximately how many people travel less than 100 miles on the Monday after Thanksgiving?

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21. What is the optimal amount of money the J. Company should spend on advertising to maximize profit?
22. How many tons of apples were harvested in 2007?
23. Predict the home mortgage interest rate in 2015. Is this likely? Explain your reasoning.

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24. What shell size is best for laying the largest clutch of eggs? Why might larger size shells be associated with smaller clutches of eggs?

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