S.ID.B.6: Regression 1

1 The table below shows the number of grams of carbohydrates, x, and the number of Calories, y, of six different foods.

Carbohydrates (x)	Calories (y)
8	120
9.5	138
10	147
6	88
7	108
4	62

Which equation best represents the line of best fit for this set of data?

1) $y = 15x$
2) $y = 0.07x$
3) $y = 0.1x - 0.4$
4) $y = 14.1x + 5.8$

2 Emma recently purchased a new car. She decided to keep track of how many gallons of gas she used on five of her business trips. The results are shown in the table below.

Miles Driven	Number of Gallons Used
150	7
200	10
400	19
600	29
1000	51

Write the linear regression equation for these data where miles driven is the independent variable. (Round all values to the *nearest hundredth*.)

3 The accompanying table shows the enrollment of a preschool from 1980 through 2000. Write a linear regression equation to model the data in the table.

Year (x)	Enrollment (y)
1980	14
1985	20
1990	22
1995	28
2000	37

4 Omarja has a balloon. He lets it go and has a means of measuring its distance in the air after so many seconds. Some of the data collected are listed in the table below.

Time (s)	4	5	6	7	8
Distance (m)	14	18	29	59	131

Decide whether a Linear, Quadratic, or Exponential model is best to model the data. Write the equation that is best for the data. Explain what the *y*-intercept means in the context of the problem.

5 In a mathematics class of ten students, the teacher wanted to determine how a homework grade influenced a student's performance on the subsequent test. The homework grade and subsequent test grade for each student are given in the accompanying table.

Homework Grade (*x*)	**Test Grade** (*y*)
94	98
95	94
92	95
87	89
82	85
80	78
75	73
65	67
50	45
20	40

a) Give the equation of the linear regression line for this set of data.

b) A new student comes to the class and earns a homework grade of 78. Based on the equation in part *a*, what grade would the teacher predict the student would receive on the subsequent test, to the *nearest integer*?