**CCM8 Creating a Linear Model**

When creating a linear model, you will want to find the equation of the line that fits your data.

Remember that equations of lines can be written in the form$ \\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$.

* In this equation the variable $m$ represents the **\_\_\_\_\_\_\_\_\_** of the data.
	+ **\_\_\_\_\_\_\_\_\_** is found by counting how many units the line rises vertically and dividing that by the number of units that the line runs horizontally ($\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_).$
	+ **\_\_\_\_\_\_\_\_\_** can also be found with the formula$ \\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$. Where the points **\_\_\_\_\_\_\_\_\_\_\_**and **\_\_\_\_\_\_\_\_\_\_\_** are on the line.
* The variable $b$ in the equation $y=mx+b$ represents the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of the liner model.
	+ The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**can be found by looking at the line and finding where the line crosses the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	+ The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**can also be found when you know the slope and a point on the line by substituting the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**and the point **\_\_\_\_\_\_\_\_\_\_\_\_\_** into the equation **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, and solving the equation for$\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_.$

Example 1: This data is from a survey that asked students how long they spent on math homework every night and their grade in math class. Determine an approximate linear equation that models the data.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Time in Minutes | 20 | 30 | 0 | 40 | 25 | 15 | 10 | 45 | 30 | 25 |
| Math Grade | 87 | 90 | 60 | 91 | 87 | 85 | 80 | 94 | 95 | 93 |

Example 2: Data was collected from a local group that meets once a month to clean up trash at a local park. They recorded the amount of time that it took to clean up the park and the number of volunteers that they had working that day. Determine an approximate linear equation that models the data.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of workers | 10 | 8 | 7 | 12 | 5 | 8 | 6 | 9 |
| Time | 4 | 2.1 | 2 | 1.6 | 2.6 | 2 | 2.4 | 1.9 |

**Independent Practice**

1. Data from the first 10 games for a baseball team are provided in the table. Determine an approximate linear equation that models the data.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Game  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Hits | 10 | 8 | 15 | 18 | 12 | 9 | 7 | 9 | 14 | 15 |
| Runs  | 4 | 3 | 7 | 6 | 5 | 4 | 1 | 2 | 8 | 6 |



1. Data from the first 10 games for a basketball team are provided in the table. Determine an approximate linear equation that models the data.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Game | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Turnovers | 10 | 15 | 8 | 12 | 14 | 10 | 11 | 13 | 9 | 20 |
| Points | 60 | 48 | 60 | 55 | 56 | 59 | 61 | 54 | 63 | 40 |

