**CCM8 Interpreting Linear Models**

When interpreting linear models you can use the slope of the equation to describe the **\_\_\_\_\_\_\_\_\_\_\_\_\_** in the variables and the y-intercept to describe the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the linear model.

The linear equation can also be used to make predictions for data values that have not been previously collected or measured.

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. The equation $y=\frac{3}{5}x+72 $was previously found as the equation of the line that models this data set.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |

* What do the slope and y-intercept represent in this context?
* According to this model, if a student spends 35 minutes a night on their math homework, what is their math grade?
* According to this model, if a student has an 81 as their math grade, how long do they spend each night on math homework?

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. The equation $y=-0.175x+3.5 $was previously found as the equation of a line that models this 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 |

* What do the slope and y-intercept represent in this context?
* According to this model, if 11 workers were to volunteer, how long will it take to clean up the park?
* According to this model, if it took 1.75 hours to clean the park, how many workers volunteered that day?

**Independent Practice**

1. Data from the first 10 games for a baseball team are provided in the table. The equation $y=\frac{2}{3}x-3$ was previously found as an equation of a line that models this 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 |

* What do the slope and y-intercept represent in this context?
* According to this model, if the team has 13 hits in a game, how many runs would they have scored?
* According to this model, if the team scored 9 runs, how many hits did the team have in that game?



1. Data from the first 10 games for a basketball team are provided in the table. The equation $y=\frac{-19}{10}x+78$ was previously found as an equation of a line that models this 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 |

* What do the slope and y-intercept represent in this context?
* According to this model, if the team has 16 turnovers, how many points did they score in that game?
* According to this model, if the team scores 58 points, how many turnovers did the team have in that game?

