| **Type of Representation** | **Representation** | **How it Matches *y = 5x – 8*** |
| --- | --- | --- |
| **Phrase** | cost is $5 per day minus an $8 rebate | **In the equation *y* = 5*x* – 8, 5 represents the slope, and** −**8 represents the *y*-intercept.**  A cost of $5 per day indicates a constant rate of change (or slope) of 5. No matter the number of days, there will always be an $8 discount; so even at 0 days, the price would technically be −$8 due to the rebate. In other words, when *x* is 0, *y* is −8; thus, −8 is the *y*-intercept. |
| **Sentence** | Profit equals 5 dollars per sandwich minus 8 dollars for ingredients.  **Linear Representations (KEY)** | **In the equation *y* = 5*x* – 8, 5 represents the slope, and** −**8 represents the *y*-intercept.**  A profit of $5 per sandwich indicates a constant rate of change (or slope) of 5. The subtraction of $8 for ingredients is not dependent on the number of sandwiches sold. So when 0 sandwiches are sold (or *x*=0), there would be a profit of −$8 (or *y*=−8). Thus, the *y*-intercept is −8. |
| **Sequence** | −3, 2, 7, 12, 17,… | **In the equation *y* = 5*x* – 8, 5 represents the slope, and** −**8 represents the *y*-intercept.**  This sequence can be viewed as the list of ordered pairs: (1, −3), (2, 2), (3, 7) … where *x* = the position number and *y* = the term value in the sequence. Using the slope formula with any two of these ordered pairs, you get a slope of 5. Then you may substitute the slope, one *x*-value, and one corresponding *y*-value into the slope-intercept form to solve for *b*. *b* is the *y*-intercept and turns out to be −8. |
| **Ordered Pairs** | (−4, −28), (−1, −13), (0, −8), (4, 12) | **In the equation *y* = 5*x* – 8, 5 represents the slope, and** −**8 represents the *y*-intercept.**  Using the slope formula with any two of these ordered pairs, you get a slope of 5. Then you may substitute the slope, one *x*-value, and one corresponding *y*-value into the slope-intercept form to solve for *b*. *b* is the *y*-intercept and turns out to be −8. |
| **Equation** | *y* = 5*x* −8 | The equations match! |
| **Table** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | ***x*** | -2 | -1 | 0 | 1 | 2 | | ***y*** | -18 | -13 | -8 | -3 | 2 | | **In the equation *y* = 5*x* – 8, 5 represents the slope, and** −**8 represents the *y*-intercept.**  As the *x*-values in the table increase by one each time, the *y*-values increase by 5. This gives a ratio in the change of *y* values to the change in *x* values of 5/1 or 5. Thus, 5 is the constant rate of change or slope. The *y*-intercept is the *y*-value in the table where *x*=0, and this is clearly −8. |
| **Graph** | *M-8-7-1-5x-8.tif* | **In the equation *y* = 5*x* – 8, 5 represents the slope, and** −**8 represents the *y*-intercept.**  The slope of the graph is the ratio of the rise to the run from point to point. Here, as the line runs by 1, it rises by 5. Thus, the rise over run is 5/1 or 5. The graph crosses the *y*-axis at −8, so the *y-*intercept is −8. |
| **Situation** | I owed a friend 8 dollars. Each day, I made 5 dollars. At the end of Day 2, I was in the clear (positive). | **In the equation *y* = 5*x* – 8, 5 represents the slope, and** −**8 represents the *y*-intercept.**  Each day, I make $5. This is a constant rate of change, or slope, of 5. Because I owe my friend $8, however, I must subtract this value off what I make. This would yield the equation *y* = 5*x* – 8. |