**Linear or Not? (KEY)**

**For each function representation below, state whether it is linear or not, and explain why.**

| **Representation Type** | **Representation Example** | **Constant Rate of Change?** | **Explain** |
| --- | --- | --- | --- |
| **Phrase** | Cost per minute | Yes | The key word here is “per.” With each passing minute, there is a given associated cost. Therefore, the rate of change is constant. |
| **Sentence** | I bake 12 cookies every 30 minutes. | Yes | The key word here is “every.” For every 30 minutes, another set of 12 cookies is baked. This creates the sequence 12, 24, 36, 48 … The rate of change is 12, and it is constant. |
| **Sequence** | 2, 4, 8, 16, … | No | The difference between each consecutive term is not the same. There is a pattern in the rate of change (21, 22, 23, …), but this is not a constant rate of change. |
| **Ordered Pairs** | (−6, 21), (3, 3), (−1, 11), (6, −3) | Yes | The ordered pairs can be graphed to easily see the rate of change. Another idea is to list the values in a table and see if the ratio in the change of y values to the change of x values is constant. In this case, there is a constant rate of change of -2. |
| **Equation** |  | Yes | The equation form of the function shows a highest degree of 1, indicating a linear function. (This equation is also written in slope-intercept form, another indicator of a linear function.) |
| **Table** | |  |  | | --- | --- | | ***x*** | ***y*** | | −2 | 10 | | −1 | 4 | | 0 | -3 | | 1 | −6 | | 2 | −20 | | No | The ratio in the change of y values to the change in x values from row to row is not the same. |
| **Graph** | **M-8-7-R-LR-Key.tif** | Yes | The graph is a straight line, so there must be a constant slope or rate of change. |
| **Situation** | A plane descends at *x* feet per second. What is the rate of change, and when will the plane reach the ground? | Yes | The rate of change is x feet per second. This rate will not change, and it is therefore constant. |