Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Investigating Patterns (Formative Assessment):**

**Translations of Rational Functions**

A **translation** is a transformation of the graph of a function in a way that moves every point on the graph the same distance in the same direction. This investigation will take you through different characteristics of translations. You are allowed to use the GDC.

|  |  |
| --- | --- |
| **Criteria B (Investigating Patterns)** | **Criteria C (Communicating)** |
| i. select and apply mathematical problem-solving techniques to discover complex patterns ii. describe patterns as general rules consistent with findings iii. prove, or verify and justify, general rules.  | i. use appropriate mathematical language (notation, symbols and terminology) in both oral and written explanations ii. use appropriate forms of mathematical representation to present information iii. move between different forms of mathematical representation iv. communicate complete, coherent and concise mathematical lines of reasoning v. organize information using a logical structure.  |

1) In the grid below, graph the function, $f\left(x\right)=\frac{1}{x}$ and label it on the attached grid (on the back).

2) Write the explicit equation for $f(x-4)$. Then graph it and label it.

3) How are the graphs of $f(x)$ and $f(x-4)$ different? What changed and what remained the same? Write in point-form notes.

4) Write the explicit equation for $f(x+7)$. Then graph it and label it.

5) How are the graphs of $f(x)$ and $f(x+7)$ different? What changed and what remained the same?

**General Statement:**

6) How are the graphs of $f(x)$ and $f(x-c)$ different, where c is a constant (not a variable)? What aspects of $f(x)$ changes, and how? Write in paragraph form.

**Further Thinking:**

7) The graph of $f(x-k)$ is not defined when $x=-5$. What is the value of k, where k is a natural number? Justify your answer.

On this grid, you should have:

* $f\left(x\right)=\frac{1}{x}$
* $f\left(x-4\right)$
* $f(x+7)$

