$\qquad$

## Practice - Key Features of Graphs

1) Use the function $f(x)=2 x+4$.
a) Before you graph it, predict: Should this graph be linear or nonlinear? Why?
b) Complete the table and graph it:


| $\mathbf{x}$ | $\mathbf{f}(\mathbf{x})$ |
| :---: | :---: |
| -3 |  |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

c) Do you notice a pattern in the outputs? What is it?
d) Increasing/Decreasing?
e) x-intercept:
f) $y$-intercept:
g) Does it have a constant slope?
2) Use the function $g(x)=-3 x-1$
a) Before you graph it, predict: Should this graph be linear or nonlinear? Why?
b) Complete the table and graph it:


| $\mathbf{x}$ | $\mathbf{g}(\mathbf{x})$ |
| :---: | :---: |
| -3 |  |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

c) Do you notice a pattern in the outputs? What is it?
d) Increasing/Decreasing?
e) x-intercept:
f) $y$-intercept:
g) Does it have a constant slope?
3) Use the function $h(x)=x^{2}+1$
a) Before you graph it, predict: Should this graph be linear or nonlinear? Why?
b) Complete the table and graph it:


| $\mathbf{x}$ | $\mathbf{h}(\mathbf{x})$ |
| :---: | :---: |
| -3 |  |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

c) Do you notice a pattern in the outputs? What is it?
d) Increasing/Decreasing?
e) $x$-intercept:
f) $y$-intercept:
g) Does it have a constant slope?

For 4-7, draw the graph according to the instructions. NOTE: One of them is impossible! Label that one "impossible."
4) Draw a graph that is increasing, then decreasing. The x-intercepts should be -6 and 6, and the y-intercept should be 2 .

6) Draw a graph that is increasing, then decreasing, then increasing, then decreasing. The y-intercept should be -4, and there should be no x-intercept.

5) Draw a graph that is decreasing, then increasing. The only x-intercept should be 4. The $y$-intercept should be 6 .

7) Draw a graph that is decreasing, then increasing, then decreasing. The x-intercepts should be $-8,-6$, and 5 . The $y$-intercept should be -4.


