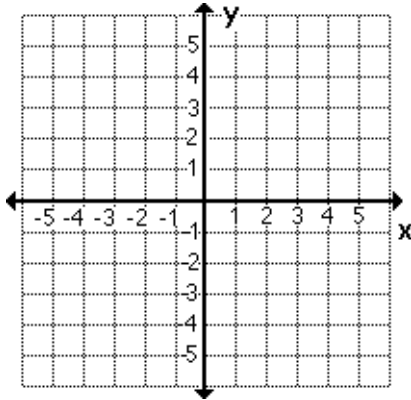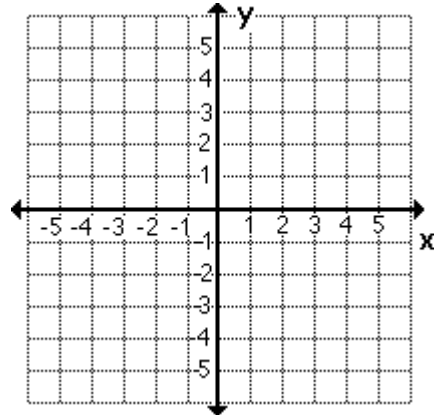# Graphing Rational Functions

1. Complete the table below for $f(x) = \dfrac{1}{x}$ and graph on the Cartesian plane.

2. Add one to each y value found in question number one and graph below.

| $x$ | $f(x)$ |
|---|---|
| -3 | |
| -2 | |
| -1 | |
| $-\dfrac{3}{4}$ | |
| $-\dfrac{1}{2}$ | |
| $-\dfrac{1}{4}$ | |
| 0 | |
| $\dfrac{1}{4}$ | |
| $\dfrac{1}{2}$ | |
| $\dfrac{3}{4}$ | |
| 1 | |
| 2 | |
| 3 | |

| $x$ | $f(x)$ |
|---|---|
| -3 | |
| -2 | |
| -1 | |
| $-\dfrac{3}{4}$ | |
| $-\dfrac{1}{2}$ | |
| $-\dfrac{1}{4}$ | |
| 0 | |
| $\dfrac{1}{4}$ | |
| $\dfrac{1}{2}$ | |
| $\dfrac{3}{4}$ | |
| 1 | |
| 2 | |
| 3 | |

3. Describe the relationship between the graphs of the two functions. In other words, how is graph number two related to number 1?
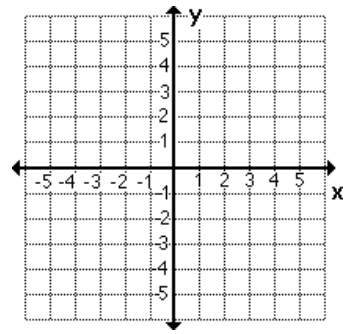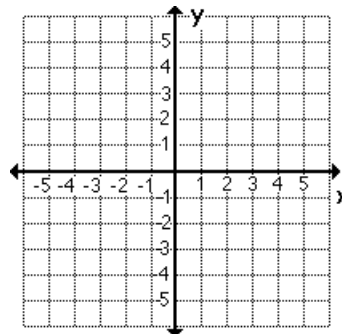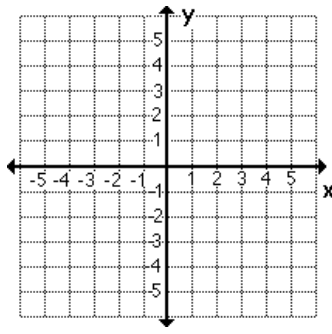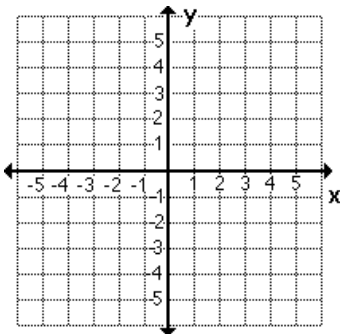
Sketch the graph each of the following
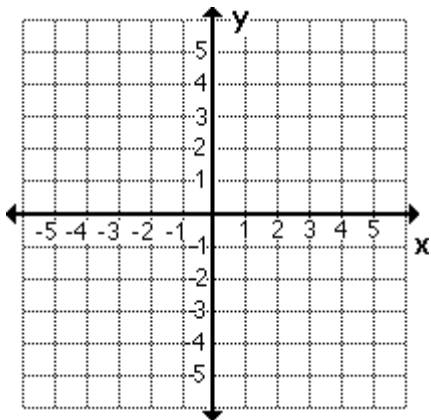
4. $f(x) = \dfrac{1}{x} - 3$

5. $f(x) = \dfrac{1}{x} + 2$

6. $f(x) = -\dfrac{1}{x}$
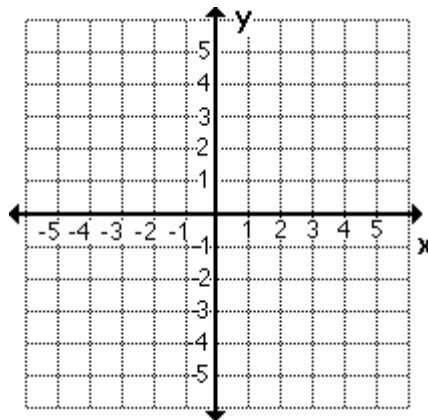
7. $f(x) = -\dfrac{1}{x} + 1$

8. Complete the table below for $f(x) = \dfrac{1}{x-2}$ and graph on the Cartesian plane.

9. Complete the table below for $f(x) = \dfrac{1}{x+2}$ and graph on the Cartesian plane.

| $x$ | $f(x)$ |
|---|---|
| -1 | |
| 0 | |
| 1 | |
| $1\frac{1}{4}$ | |
| $1\frac{1}{2}$ | |
| $1\frac{3}{4}$ | |
| 2 | |
| $2\frac{1}{4}$ | |
| $2\frac{1}{2}$ | |
| $2\frac{3}{4}$ | |
| 3 | |
| 4 | |
| 5 | |



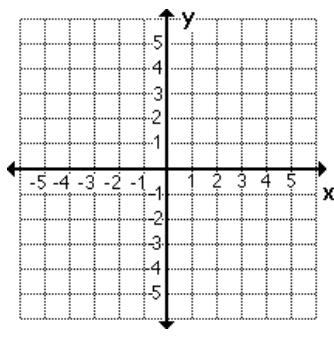| $x$ | $f(x)$ |
|---|---|
| -5 | |
| -4 | |
| -3 | |
| $-2\frac{3}{4}$ | |
| $-2\frac{1}{2}$ | |
| $-2\frac{1}{4}$ | |
| -2 | |
| $-1\frac{3}{4}$ | |
| $-1\frac{1}{2}$ | |
| $-1\frac{1}{4}$ | |
| -1 | |
| 0 | |
| 1 | |



10. Describe the effect of $a$, $h$ and $k$ given $f(x) = a\left(\dfrac{1}{x-h}\right) + k$

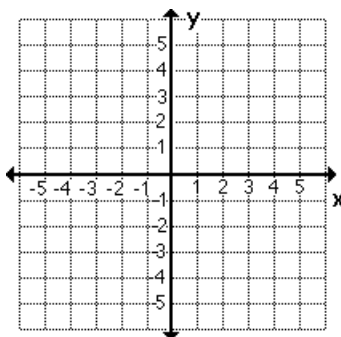Sketch the graph of each of the following.

11. $f(x) = \dfrac{1}{x-1}$
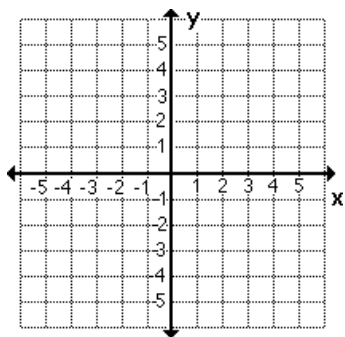
12. $f(x) = -\dfrac{1}{x+2}$

13. $f(x) = \dfrac{1}{x-3} - 2$

14. $f(x) = \dfrac{1}{x-1} + 1$