LESSON 130

1. Reflect over the x-axis.
Shift up 3 units.

2. Stretch vertically by 2.
Shift right 1 unit.

3. Vertical asymptote: $x = 0$
Horizontal asymptote: $y = 0$

4.

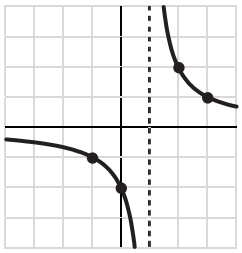
$y = \frac{1}{x}$	Parent function
$y = \frac{4}{x}$	Stretch vertically by 4.
$f(x) = \frac{4}{x+3}$	Shift left 3 units.

5.

$y = \frac{1}{x}$	Parent function
$y = -\frac{1}{x}$	Reflect over the x-axis.
$y = -\frac{1}{x-2}$	Shift right 2 units.
$f(x) = -\frac{1}{x-2} + 5$	Shift up 5 units.

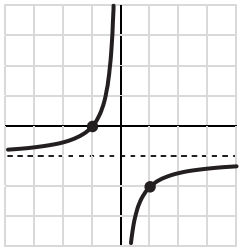
6. Vertical asymptote: $x = 2$
Horizontal asymptote: $y = 5$

7.



Graph $y = 1/x$.
Stretch vertically by 2.
Shift right 1 unit.
V. asymptote: $x = 1$
H. asymptote: $y = 0$

8.



Graph $y = 1/x$.
Reflect over the x-axis.
Shift down 1 unit.
V. asymptote: $x = 0$
H. asymptote: $y = -1$

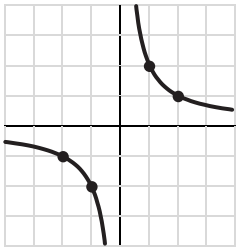
9. Shift right 3 units.

10. Shift left 4 units.
Shift down 3 units.

11. Stretch vertically by 2.
Reflect over the x-axis.
Shift left 5 units.

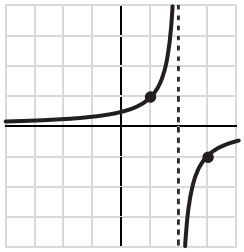
12. Stretch vertically by 3.
Shift right 2 units.
Shift up 7 units.

13.



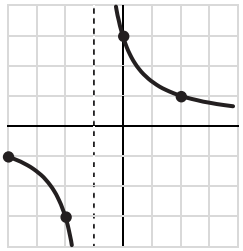
Graph $y = 1/x$.
Stretch vertically by 2.
V. asymptote: $x = 0$
H. asymptote: $y = 0$
Domain: $x \neq 0$
Range: $y \neq 0$

14.



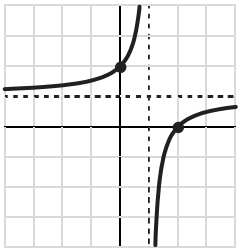
Graph $y = 1/x$.
Reflect over the x-axis.
Shift right 2 units.
V. asymptote: $x = 2$
H. asymptote: $y = 0$
Domain: $x \neq 2$
Range: $y \neq 0$

15.



Graph $y = 1/x$.
Stretch vertically by 3.
Shift left 1 unit.
V. asymptote: $x = -1$
H. asymptote: $y = 0$
Domain: $x \neq -1$
Range: $y \neq 0$

16.



Graph $y = 1/x$.
Reflect over the x-axis.
Shift right 1 unit.
Shift up 1 unit.
V. asymptote: $x = 1$
H. asymptote: $y = 1$
Domain: $x \neq 1$
Range: $y \neq 1$

17.

$f(x) = \frac{a}{x-3} + 2$	Plug in $h = 3$ and $k = 2$.
$0 = \frac{a}{2-3} + 2$	Plug in $(2, 0)$.
$a = 2$	Solve for a.
$f(x) = \frac{2}{x-3} + 2$	Write the function.

18.

$f(x) = \frac{a}{x+2} + 1$	Plug in $h = -2$ and $k = 1$.
$-1 = \frac{a}{1+2} + 1$	Plug in $(1, -1)$.
$a = -6$	Solve for a.
$f(x) = -\frac{6}{x+2} + 1$	Write the function.