

*Rational Functions & Asymptotes*

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

1. Use this GeoGebra applet: <https://www.geogebra.org/m/Fsnt4mRk> to create the following graphs by using the h slider. For each function, sketch its graph and mark where it has a vertical asymptote. State the domain and range for each function. Be able to explain why each graph has its vertical asymptote where it is in a whole class discussion after you finish the work sheet.

a)  $y = 1/(x + 2)$  *Note that this is the same as writing the function as  $y = 1/(x - -2)$ .*

Domain:

Range:

Vertical Asymptote:

b)  $y = 1/(x + 4)$

Domain:

Range:

Vertical Asymptote:

c)  $y = 1/x$

Domain:

Range:

Vertical Asymptote:

d)  $y = 1/(x - 1)$

Domain:

Range:

Vertical Asymptote:

e)  $y = 1/(x - 3)$

Domain:

Range:

Vertical Asymptote:

2. Now use the same GeoGebra applet: <https://www.geogebra.org/m/Fsnt4mRk> to create the following graphs by using both the a and h sliders. For each function, sketch its graph and mark where it has a vertical asymptote.

a)  $y = 3/(x - 1)$

Domain:

Range:

Vertical Asymptote:

b)  $y = 2/(x - 1)$

Domain:

Range:

Vertical Asymptote:

c)  $y = -2/(x - 1)$

Domain:

Range:

Vertical Asymptote:

d) What do you think the graph of  $y = a/(x - h)$  would look like, if  $a$  and  $h$  are constants and

i)  $a > 0$ ?

ii)  $a < 0$ ?