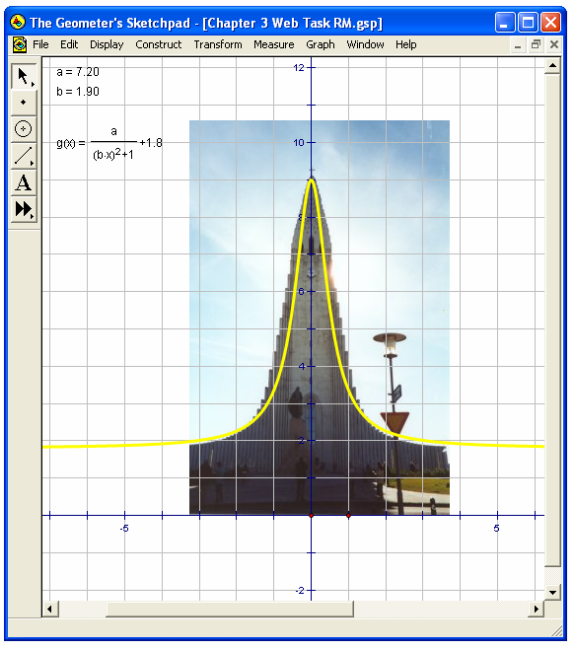
Chapter 3 Web Task

Families of Rational Functions



Rational functions are sometimes used to model real objects. To fit such functions, it is useful to recognize patterns between the equation and the graph.

Consider each function below.

- Form and explain a conjecture about the shape of the function's graph.
- Sketch the graph that corresponds to each function.
- Describe characteristics of the graph (shape, domain, range, asymptotes, maxima/minima).
- Check your results using technology.

a) $y = \dfrac{1}{x^2 - 4}$

b) $y = \dfrac{x}{x^2 - 4}$

c) $y = \dfrac{x^2}{x^2 - 4}$

d) $y = \dfrac{x^3}{x^2 - 4}$

e) $y = \dfrac{x^4}{x^2 - 4}$

f) $y = \dfrac{x^5}{x^2 - 4}$

- Describe the characteristics of the graphs of rational functions of the form $y = \dfrac{x^n}{x^2 - a^2}$, where n and a are natural numbers.