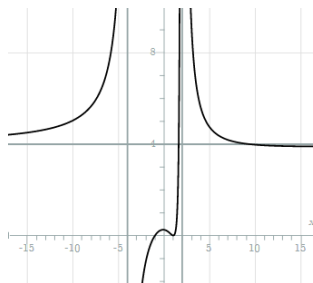


## Goals



By the end of this unit, students will:

- understand the concepts and techniques in vectors, complex numbers, functions and graph sketching
- apply reasoning skills and solve problems in vectors, complex numbers, functions and graph sketching
- communicate their arguments and strategies when solving problems
- construct proofs of results
- interpret mathematical information and ascertain the reasonableness of their solutions to problems.

**This week:** Sketching graphs:

- use and apply the notation  $|x|$  for the absolute value for the real number  $x$  and the graph of  $y = |x|$
- examine the relationship between the graph of  $y = f(x)$  and the graphs of  $y = \frac{1}{f(x)}$ ,  $y = |f(x)|$  and  $y = f(|x|)$
- sketch the graphs of simple rational functions where the numerator and denominator are polynomials of low degree.

## Theoretical Components

Mathspace Lessons:

Absolute Value Functions:

- <https://bit.ly/3c0RDPK>
- Graphing Linear Functions
- Find the Equation of an Absolute Value Function
- Domain and Range of Absolute Value Functions

Graphs of Rational Functions:

- <https://bit.ly/3uPeoPc>
- Graphing Rational Functions
- Finding equation of a Rational Function
- Solve Rational Functions Analytically

Additional readings available on Google Classroom WK06 folder.

Watch the following videos:

- Absolute Value Functions:  
<https://goo.gl/1WgrJw>
- Graphs of Rational Functions:  
<https://goo.gl/n3zBRk>  
<https://goo.gl/Gw4qli>  
<https://goo.gl/RuW2S7>

## Practical Components

Check Google Classroom WK06 folder:

- WK06 Mathspace \_\_ Domain and Range of Absolute Value Functions Questions
- WK06 Mathspace \_\_ Solutions to Absolute Value Functions Questions
- WK06 Mathspace \_\_ Graphing Absolute Value Functions Questions
- WK06 Mathspace \_\_ Graphing Hyperbolas Questions
- WK06 Mathspace \_\_ Graphing Rational Functions Questions

Attempt at least 6 questions from each of the listed exercises.

## Investigation

See the next page.

Q/F/O

Quiz/Forum/Other

Mathspace Quiz in WK06: to be completed by 16<sup>th</sup> March.

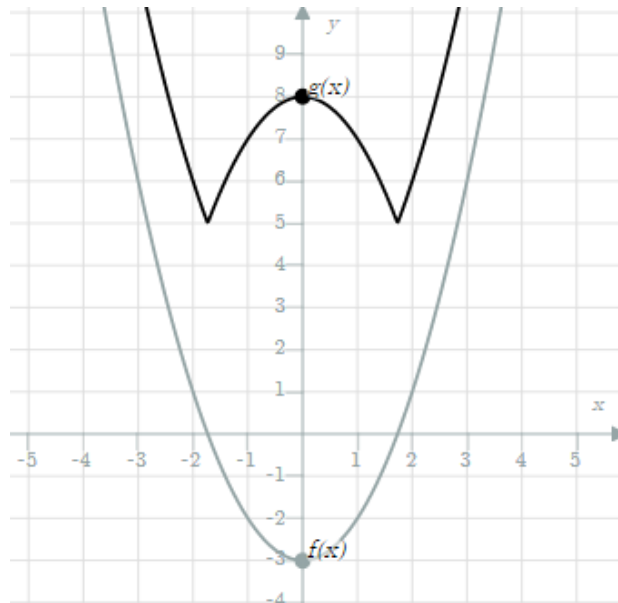
**In-Class in WK07: Tuesday, Line 8 (on Complex Roots and Graphing Rational Functions)**

## Investigation

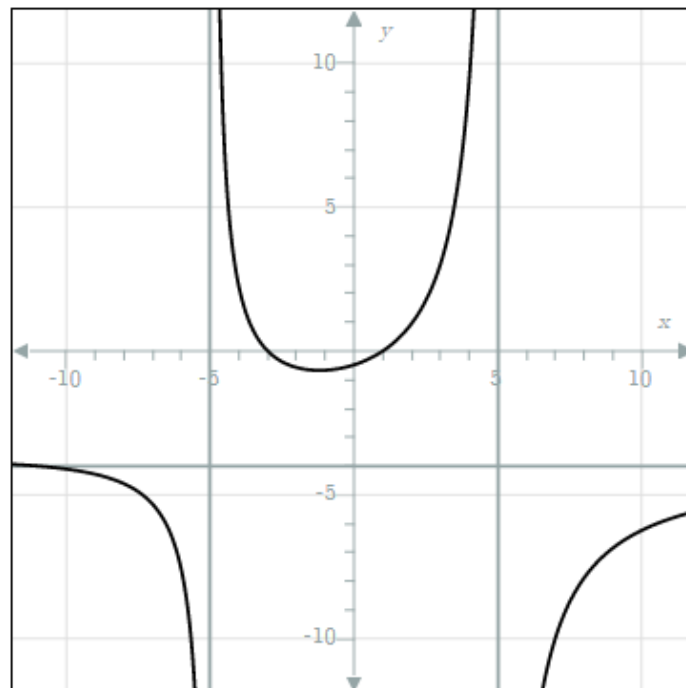
**WK06:**

Show working or justify with reasoning.

A: State the equations of  $f(x)$  and  $g(x)$ :



B: Find a rational function  $g(x)$  that has the graph shown:



20 marks

**WK07:**

a) Sketch the graph of the following, locating any stationary points and asymptotes. State the range.

$$y = \frac{x^2+x+2}{x-1}$$

b) The concentration  $C$  of a drug in a patient's bloodstream  $t$  hours after injection is given by  $C(t) = \frac{2t}{3+t^2}$ . Use a graph to explain what happens to the concentration of the drug over time.

20 marks