

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

Student #: \_\_\_\_\_

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

T.A. #: \_\_\_\_\_

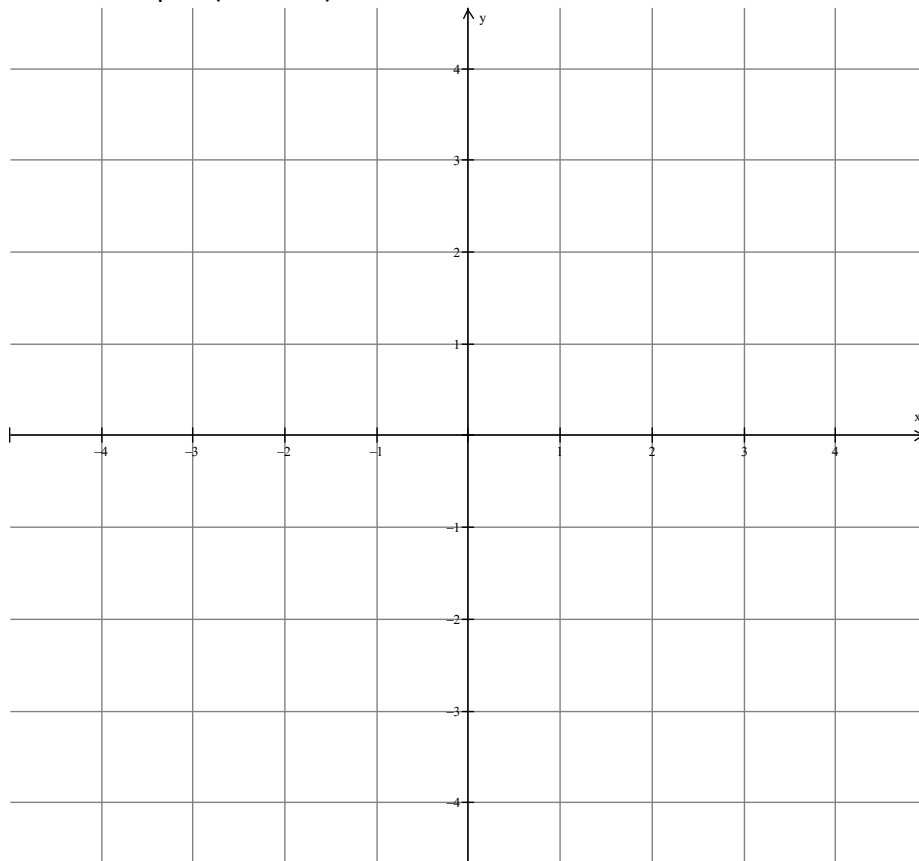
**Mathematics 12 Pre-Calculus**  
**LEARNING GUIDE 16 TEST – RATIONAL FUNCTIONS**

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**\*Full marks will NOT be given for the final answer only.**

When using a calculator, you should provide a decimal answer that is correct **to at least two decimal places** (unless otherwise indicated). Such rounding should occur **only** in the final step of the solution.

1. Sketch the graph of  $y = \frac{2x-3}{x+2}$  and determine the equations of any asymptotes and intercepts. (4 marks)



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2. Create a rational function with asymptotes at  $x = 2$  and  $y = -3$ . (2 marks)

3. For the function  $f(x) = \frac{x+3}{x^2-x-12}$ :

a) Determine the values of  $x$  where an asymptote occurs. (1 mark)

b) Determine the values of  $x$  where a point of discontinuity exists. (1 mark)

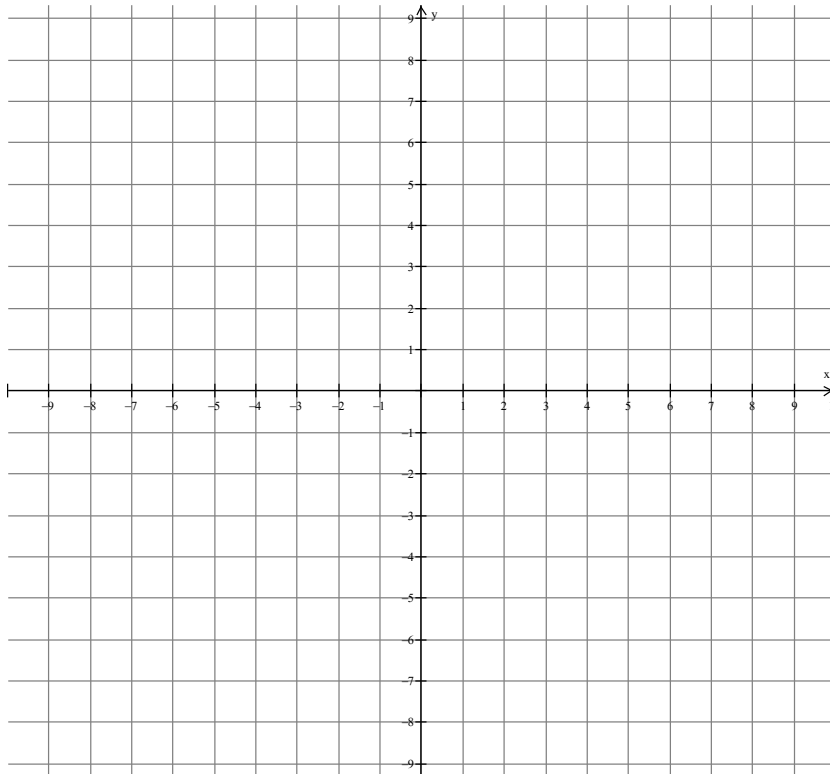
c) Determine the  $x$  and  $y$  intercepts of the function (2 marks)

4. Solve the following equation algebraically. (3 marks)

$$\frac{2}{x} = 3 - \frac{7x}{x-2}$$

5. Solve the following equation graphically. (3 marks)

$$\frac{3}{5x-7} + x = 1 + \frac{x^2 - 4x}{7-5x}$$



6. An airplane makes a 990-mi flight with a tail wind and returns, flying into the wind. The total flying time is 3 h 20 min, and the plane's airspeed is 600 mph. What is the wind speed in mph? (4 marks)