

## Chapter 9 Hand-in Assignment – Rational Functions

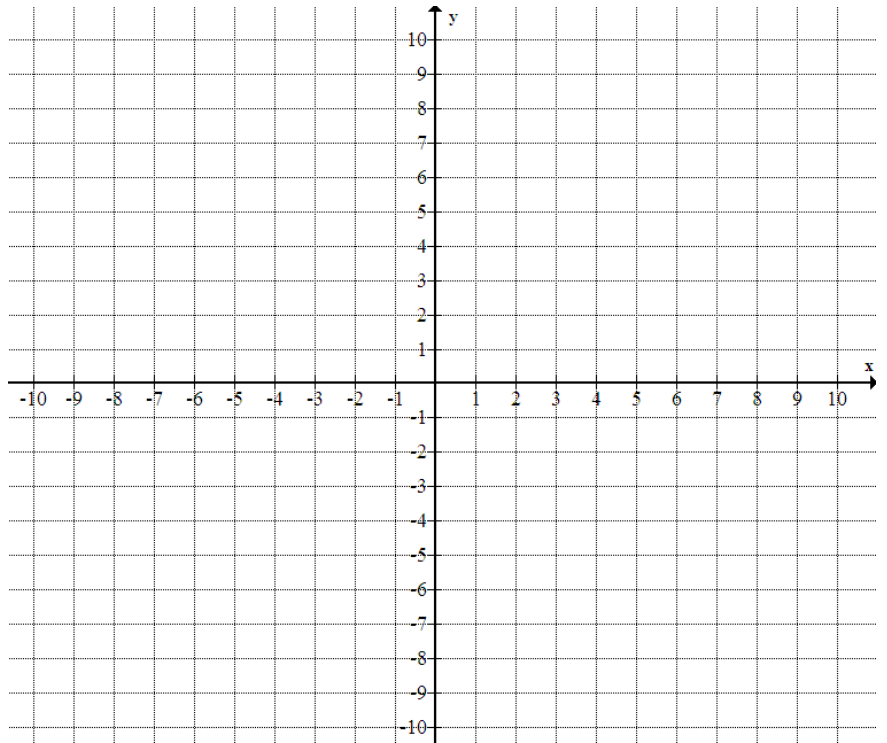
**Name:** \_\_\_\_\_

1. Given the original rational function  $y = \frac{1}{x}$  and the transformed function,  $y = \frac{-3}{x-7} + 4$ :

a) List the transformations taking place.

b) Complete the tables below. For the first table, give 6 points found on the graph of the original function  $y = \frac{1}{x}$ . For the second table, transform each point in the original table to get its image point. Write the mapping notation in the headings of the final table.

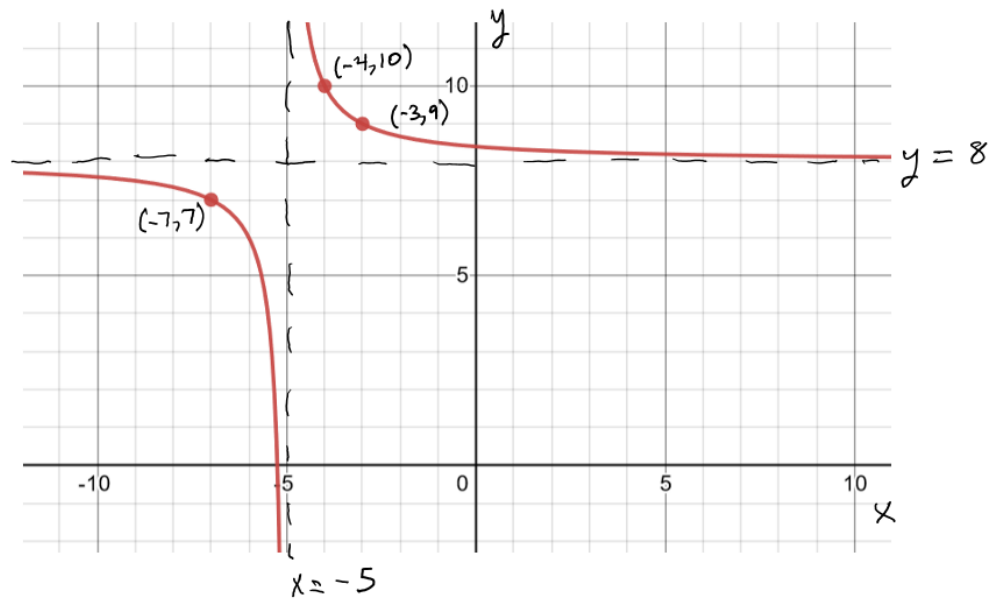




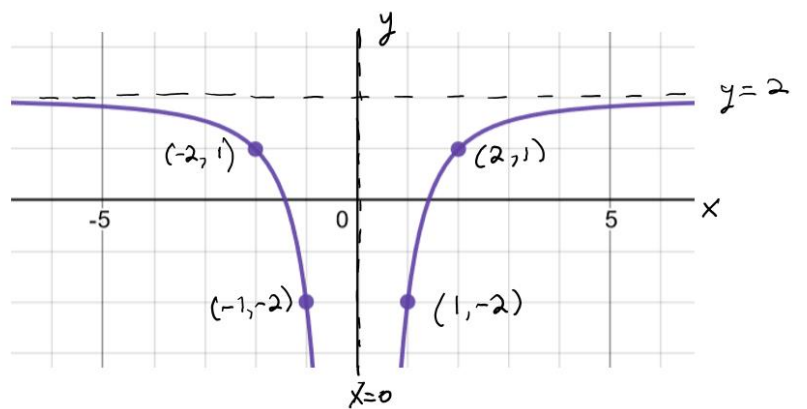
c) Accurately sketch the final transformed function. Include its asymptotes, using dotted lines. Label each asymptote with its equation.

d) Find the coordinates of the final graph's  $x$ -intercept and  $y$ -intercept.

2. What is the equation of the rational function shown below?



3. What is the equation of the rational function shown below?



4. For each of the following functions

- factor and simplify (if possible)
- determine all characteristics of each (show work).
- graph each function, showing asymptotes, intercepts and any points of discontinuity

a)  $y = \frac{3x+9}{x^2+8x+12}$

simplified form of equation:

NPVs (restrictions)

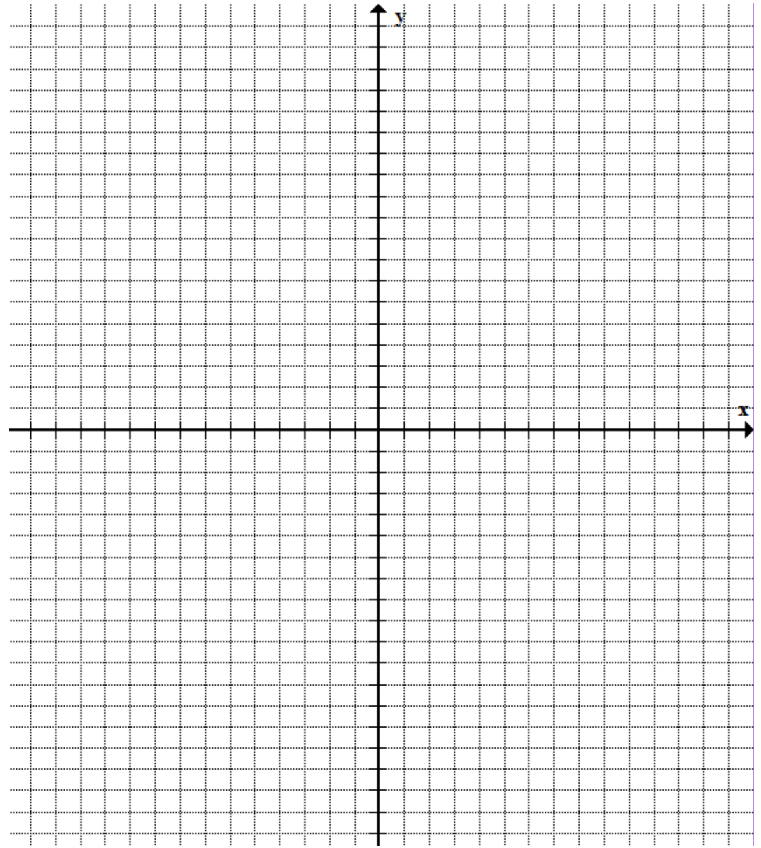
vertical asymptote equation(s)

horizontal asymptote equation

coordinates of points of discontinuity (PODs) if any

$x$ -intercept

$y$ -intercept



b)  $y = \frac{3x^2 - x - 2}{x^2 + 3x - 4}$

simplified form of equation:

NPVs (restrictions)

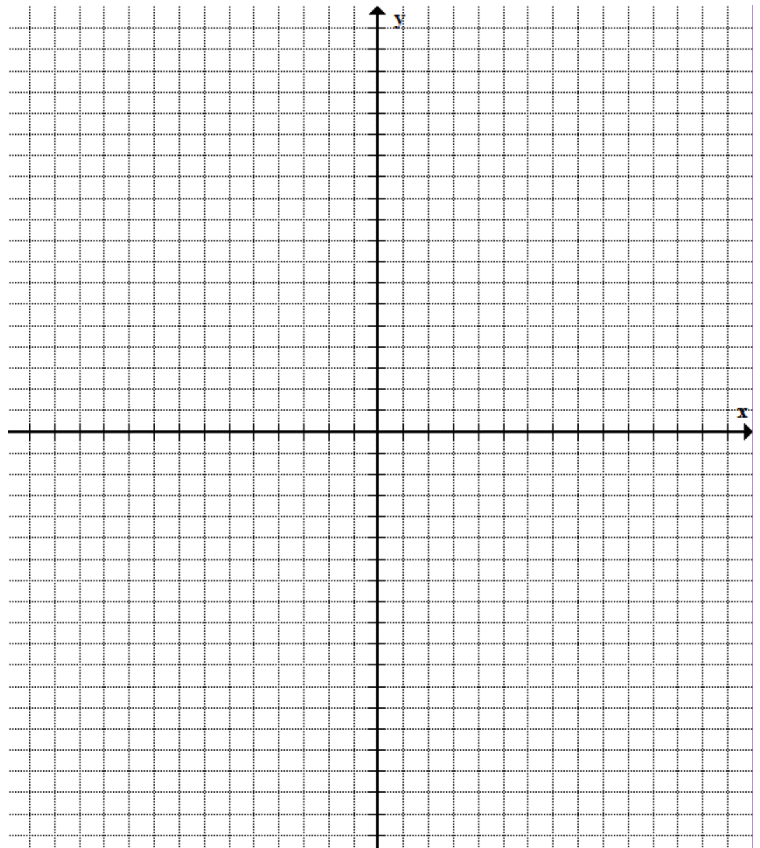
vertical asymptote equation(s)

horizontal asymptote equation

coordinates of points of discontinuity (PODs) if any

$x$ -intercept

$y$ -intercept



5. Given the following information, determine a possible equation for the rational function. Show final answer in simplified form (multiply everything out).

a) vertical asymptote equations  $x = -4$  and  $x = 2$ ; and  $x$ -intercepts at  $x = 3$  and  $x = -8$ .

b) vertical asymptote equation  $x = 6$ ;  $x$ -intercept at  $x = -1$ ; a point of discontinuity at  $x = 4$ ; horizontal asymptote equation  $y = 2$ .

6. Solve the following rational equations algebraically. Identify all restrictions (NPVs).

a)  $2x + 9 = \frac{5}{x}$

b)  $\frac{8}{x^2 - 16} + 1 = \frac{1}{x - 4}$

c)  $5 - \frac{4x}{3} = \frac{1 + 2x - x^2}{3x + 12}$

7. Tom has succeeded in 10 of his 31 attempts, when putting at the golf course. If he succeeds in half of his attempts from now on, how many more attempts will he need in order to get his average up to 45%?

Create a rational equation describing this situation. Solve the equation algebraically.