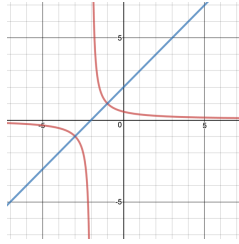
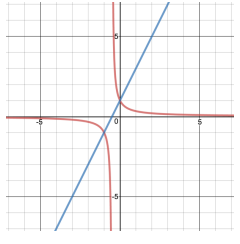
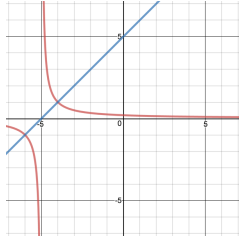
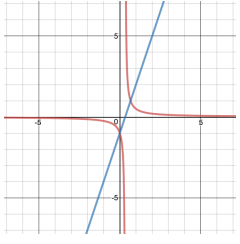
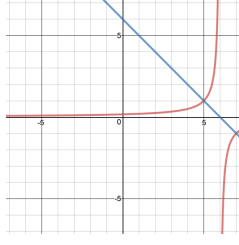
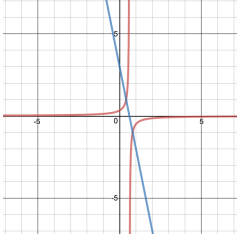
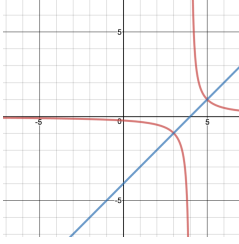
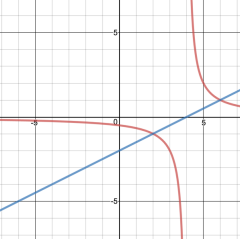
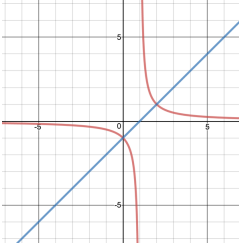
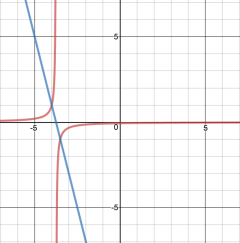
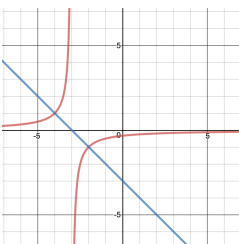


Round 1.

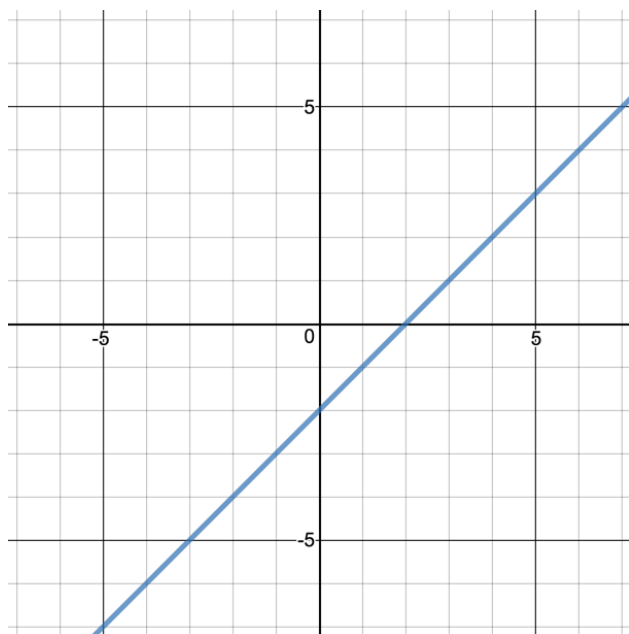
Put students in groups of 2 or 3. Each group will get a linear function and corresponding rational function. They are to graph each on the same axis. Afterwards they should determine any intercepts and/or equations of asymptotes.

Functions	Graph Answers	Functions	Graph Answers
Set 1 $a(x) = x + 2$ $b(x) = \frac{1}{x+2}$		Set 7 $o(x) = 2x + 1$ $p(x) = \frac{1}{2x+1}$	
Set 2 $c(x) = x + 5$ $d(x) = \frac{1}{x+5}$		Set 8 $q(x) = 3x - 1$ $r(x) = \frac{1}{3x-1}$	
Set 3 $f(x) = -x + 6$ $g(x) = \frac{1}{-x+6}$		Set 9 $s(x) = -5x + 3$ $t(x) = \frac{1}{-5x+3}$	
Set 4 $h(x) = x - 4$ $i(x) = \frac{1}{x-4}$		Set 10 $u(x) = \frac{1}{2}x - 2$ $v(x) = \frac{1}{\frac{1}{2}x-2}$	
Set 5 $j(x) = x - 1$ $k(x) = \frac{1}{x-1}$		Set 11 $w(x) = -4x - 15$ $z(x) = \frac{1}{-4x-15}$	
Set 6 $m(x) = -x - 3$ $n(x) = \frac{1}{-x-3}$			

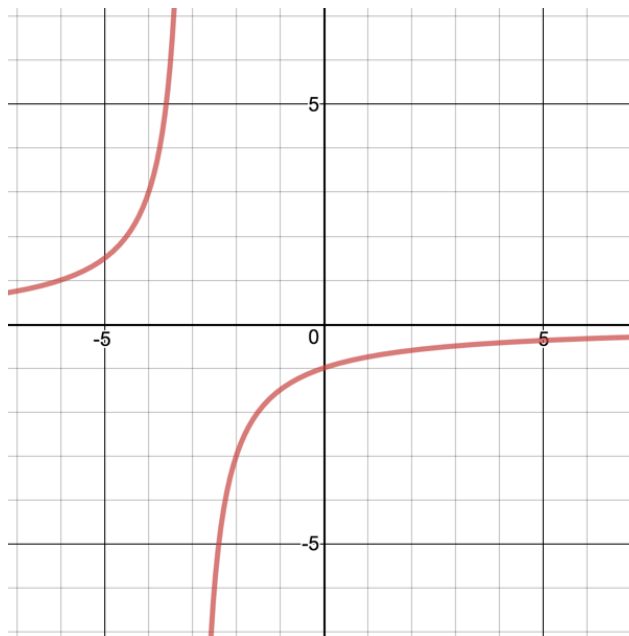
Follow up questions to round 1

1. Describe the connections between a linear function and its corresponding rational function
2. Given the following graphs, sketch a possible corresponding linear or rational function.

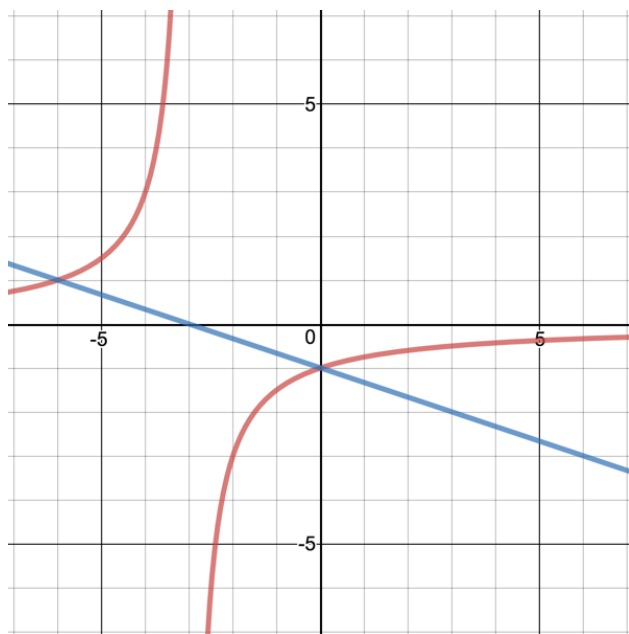
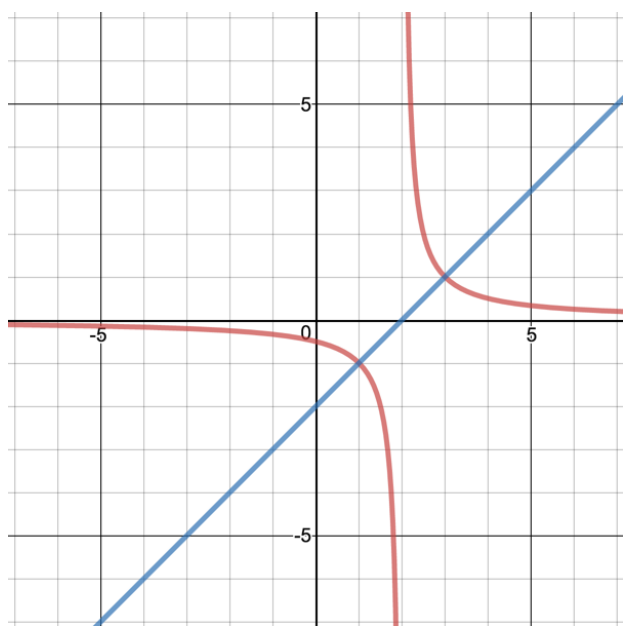
a)



b)



Answer



Round 2.

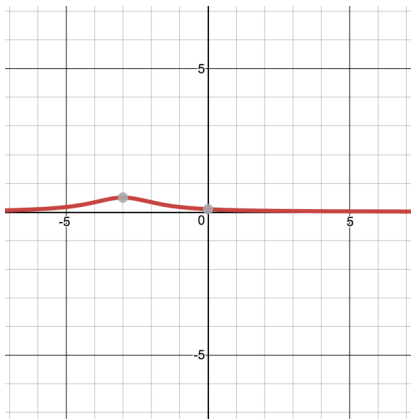
Put students in groups of 2 or 3. Each group will get a quadratic function and corresponding rational function. They are to graph each on the same axis. Afterwards they should determine any intercepts and/or equations of asymptotes and approximate vertices

Functions	Graph Answers	Functions	Graph Answers
Set 1 $a(x) = x^2 + 7x + 10$ $b(x) = \frac{1}{x^2 + 7x + 10}$		Set 7 $o(x) = -x^2 - 9x - 20$ $p(x) = \frac{1}{-x^2 - 9x - 20}$	
Set 2 $c(x) = -x^2 + 7x - 6$ $d(x) = \frac{1}{-x^2 + 7x - 6}$		Set 8 $q(x) = -x^2 + 9x - 21$ $r(x) = \frac{1}{-x^2 + 9x - 21}$	
Set 3 $f(x) = x^2 + 6x + 9$ $g(x) = \frac{1}{x^2 + 6x + 9}$		Set 9 $s(x) = x^2 - 9x + 18$ $t(x) = \frac{1}{x^2 - 9x + 18}$	
Set 4 $h(x) = x^2 + x + 2$ $i(x) = \frac{1}{x^2 + x + 2}$		Set 10 $u(x) = x^2 - 4$ $v(x) = \frac{1}{x^2 - 4}$	
Set 5 $j(x) = -x^2 - 3x + 4$ $k(x) = \frac{1}{-x^2 - 3x + 4}$		Set 11 $w(x) = x^2 - 5x$ $z(x) = \frac{1}{x^2 - 5x}$	
Set 6 $m(x) = -x^2 - 10x - 25$ $n(x) = \frac{1}{-x^2 - 10x - 25}$			

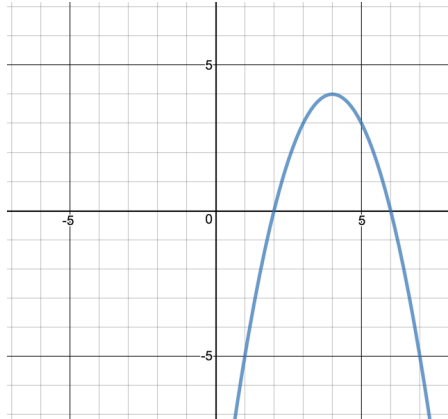
Follow up questions to round 2

1. Describe the connections between a quadratic function and its corresponding rational function
2. Given the following graphs, sketch a possible corresponding quadratic or rational function.

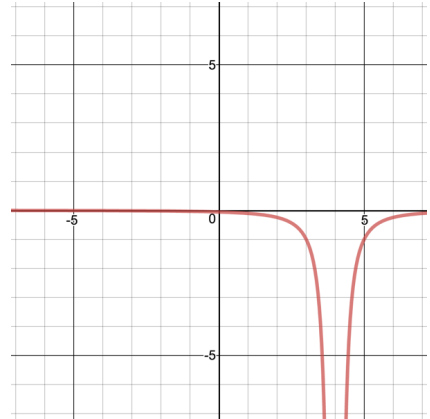
a)



b)

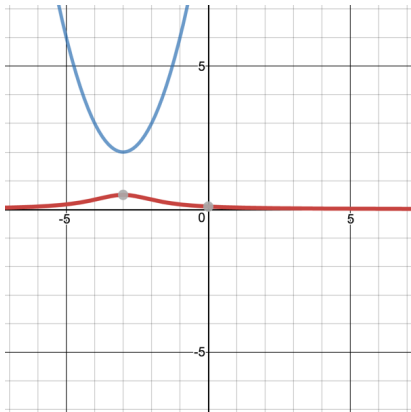


c)



Answers

a)



b)

