H Math 2 Name_____

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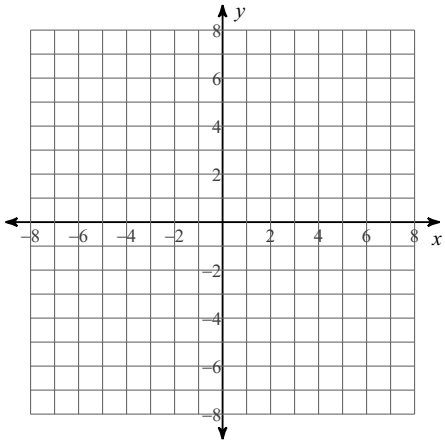
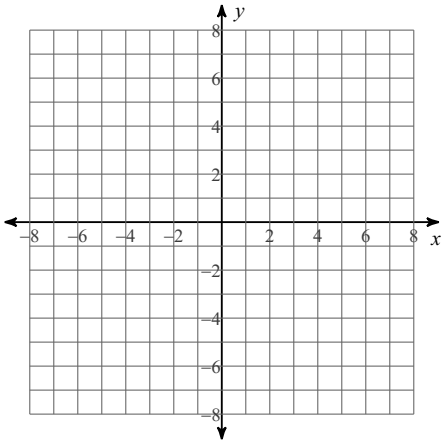
Rational Functions

Identify the vertical asymptotes, x-intercepts, horizontal asymptote, domain, and range of each. Then sketch the graph.

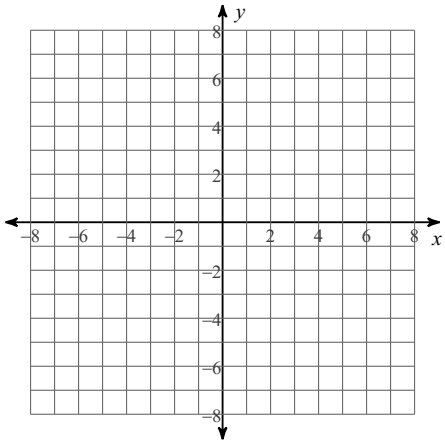
1) $f(x) = \dfrac{1}{x+4} + 3$



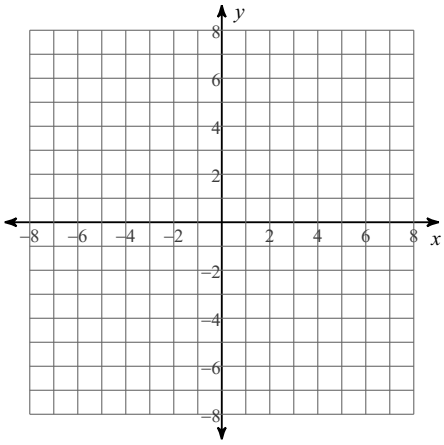
2) $f(x) = -\dfrac{1}{x+2} + 1$



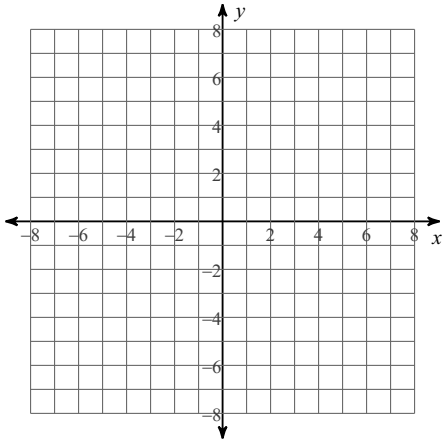
3) $f(x) = \dfrac{3}{x-2} + 1$



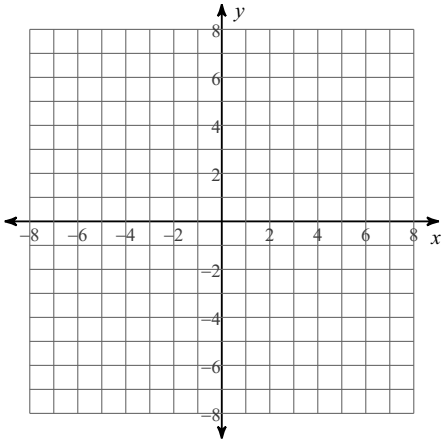
4) $f(x) = \dfrac{3}{x+2}$



5) $f(x) = -\dfrac{1}{x-4}$



6) $f(x) = -\dfrac{2}{x+2} + 3$



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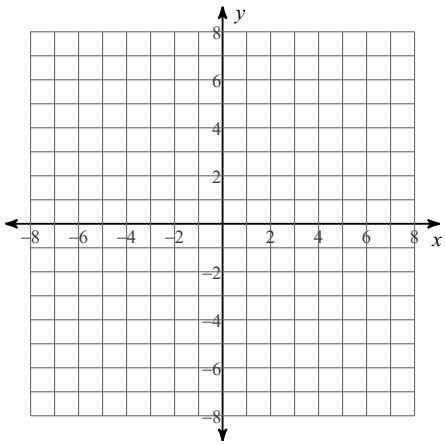
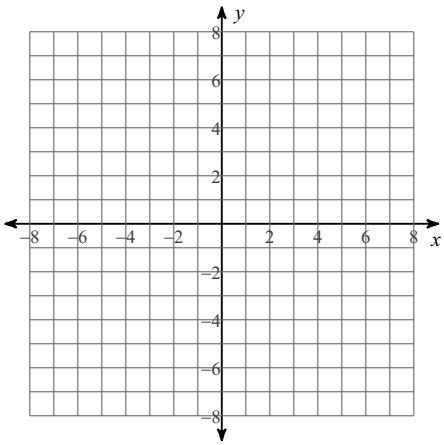
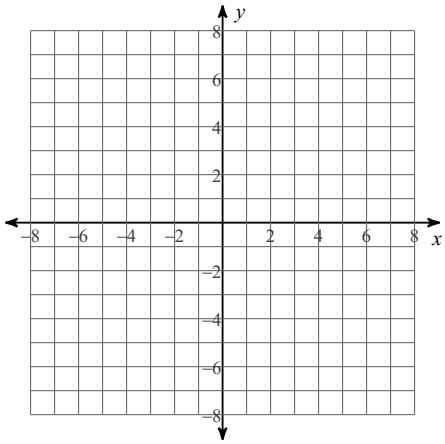
7) $f(x) = \dfrac{4}{x+1}$



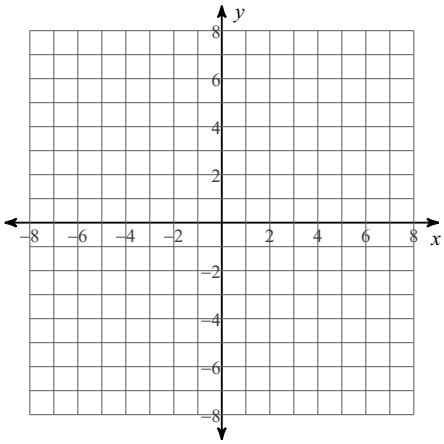
8) $f(x) = -\dfrac{1}{x} + 1$



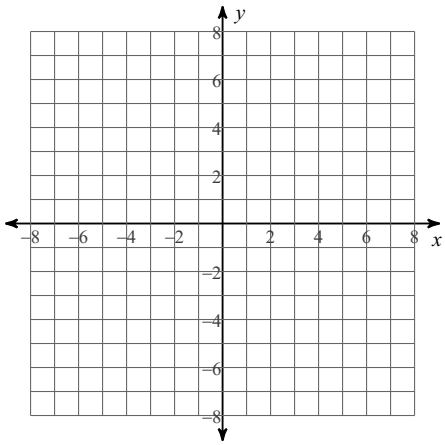
9) $f(x) = -\dfrac{3}{x} - 2$



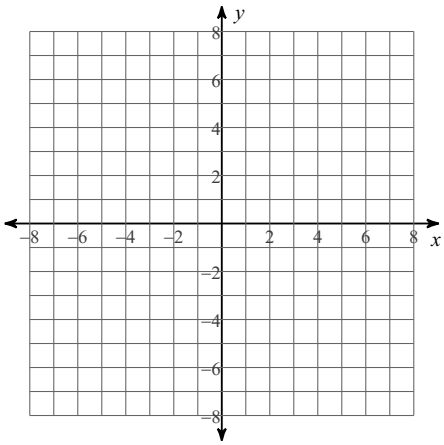
10) $f(x) = \dfrac{2}{x+3} + 1$



11) $f(x) = -\dfrac{4}{x-1} - 2$



12) $f(x) = \dfrac{3}{x+2} - 1$



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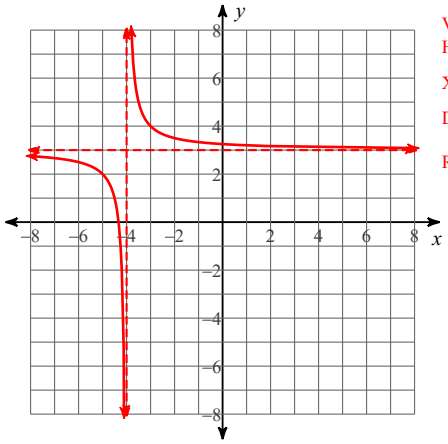
Rational Functions

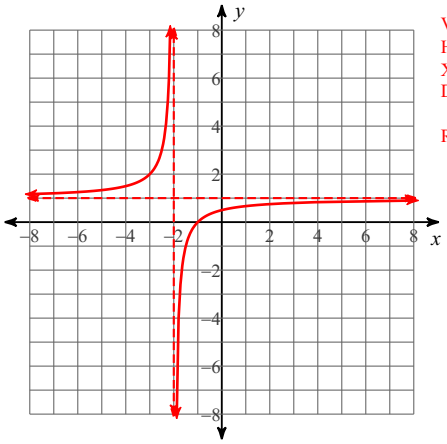
Identify the vertical asymptotes, x-intercepts, horizontal asymptote, domain, and range of each. Then sketch the graph.

1) $f(x) = \dfrac{1}{x+4} + 3$



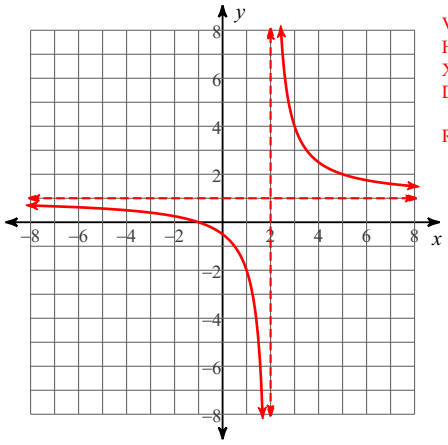
Vertical Asym.: $x = -4$
Horz. Asym.: $y = 3$
X-intercepts: $-\dfrac{13}{3}$
Domain:
All reals except -4
Range:
All reals except 3

2) $f(x) = -\dfrac{1}{x+2} + 1$



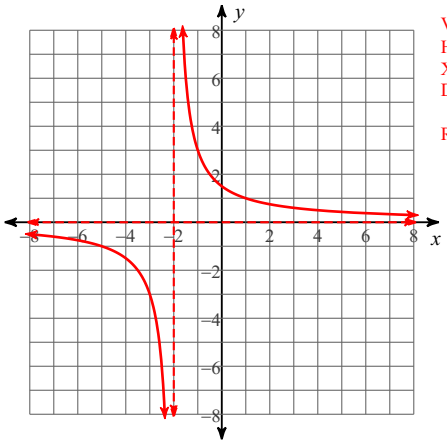
Vertical Asym.: $x = -2$
Horz. Asym.: $y = 1$
X-intercepts: -1
Domain:
All reals except -2
Range:
All reals except 1

3) $f(x) = \dfrac{3}{x-2} + 1$



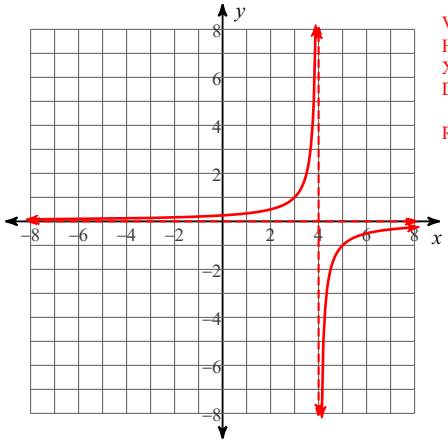
Vertical Asym.: $x = 2$
Horz. Asym.: $y = 1$
X-intercepts: -1
Domain:
All reals except 2
Range:
All reals except 1

4) $f(x) = \dfrac{3}{x+2}$



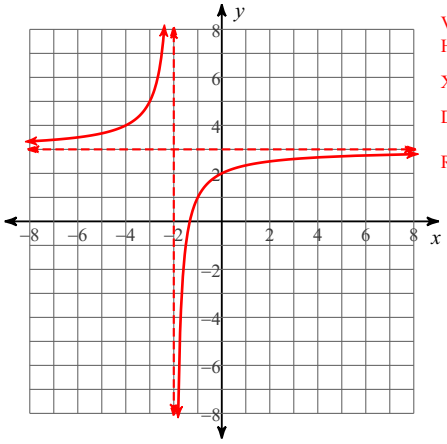
Vertical Asym.: $x = -2$
Horz. Asym.: $y = 0$
X-intercepts: None
Domain:
All reals except -2
Range:
All reals except 0

5) $f(x) = -\dfrac{1}{x-4}$



Vertical Asym.: $x = 4$
Horz. Asym.: $y = 0$
X-intercepts: None
Domain:
All reals except 4
Range:
All reals except 0

6) $f(x) = -\dfrac{2}{x+2} + 3$



Vertical Asym.: $x = -2$
Horz. Asym.: $y = 3$
X-intercepts: $-\dfrac{4}{3}$
Domain:
All reals except -2
Range:
All reals except 3

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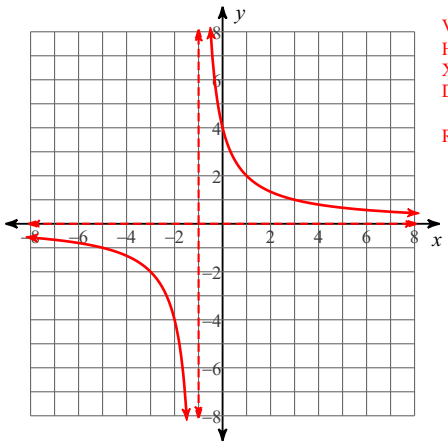
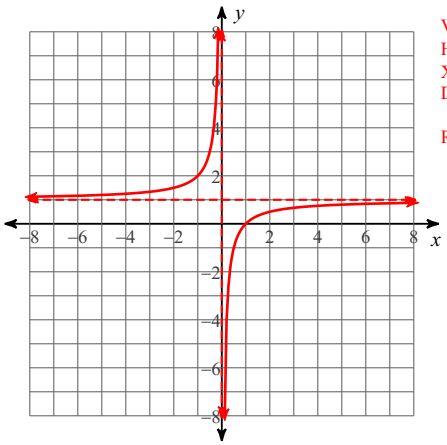
7) $f(x) = \dfrac{4}{x+1}$



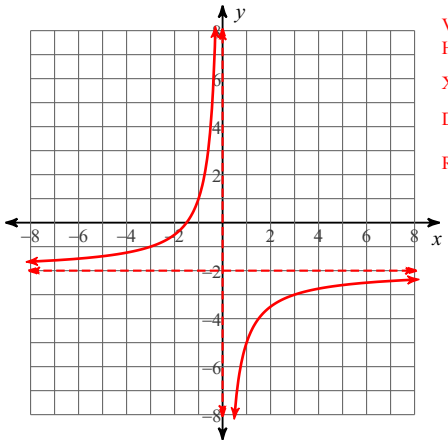
Vertical Asym.: $x = -1$
Horz. Asym.: $y = 0$
X-intercepts: None
Domain:
All reals except -1
Range:
All reals except 0

8) $f(x) = -\dfrac{1}{x} + 1$



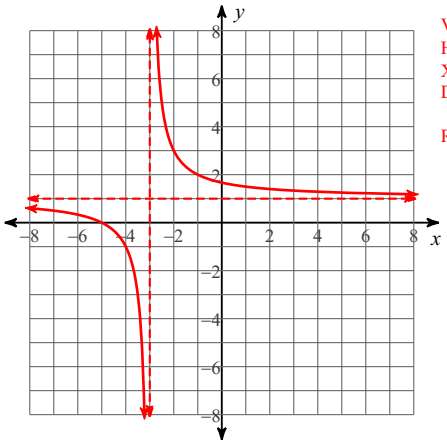
Vertical Asym.: $x = 0$
Horz. Asym.: $y = 1$
X-intercepts: 1
Domain:
All reals except 0
Range:
All reals except 1

9) $f(x) = -\dfrac{3}{x} - 2$



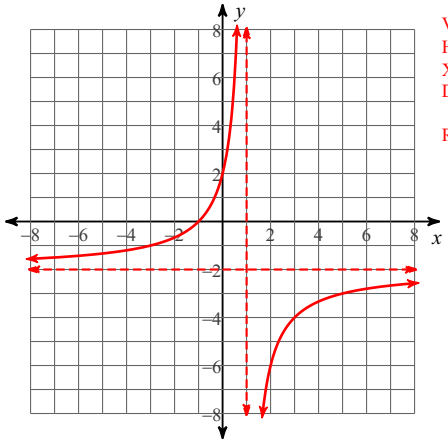
Vertical Asym.: $x = 0$
Horz. Asym.: $y = -2$
X-intercepts: $-\dfrac{3}{2}$
Domain:
All reals except 0
Range:
All reals except -2

10) $f(x) = \dfrac{2}{x+3} + 1$



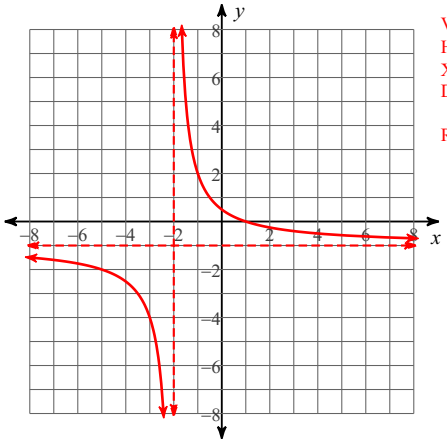
Vertical Asym.: $x = -3$
Horz. Asym.: $y = 1$
X-intercepts: -5
Domain:
All reals except -3
Range:
All reals except 1

11) $f(x) = -\dfrac{4}{x-1} - 2$



Vertical Asym.: $x = 1$
Horz. Asym.: $y = -2$
X-intercepts: -1
Domain:
All reals except 1
Range:
All reals except -2

12) $f(x) = \dfrac{3}{x+2} - 1$



Vertical Asym.: $x = -2$
Horz. Asym.: $y = -1$
X-intercepts: 1
Domain:
All reals except -2
Range:
All reals except -1

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