12-04-26-T10 rational functions

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

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

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

3) $f(x) = -\frac{1}{x-3} - 1$

4) $f(x) = -\frac{1}{x-4} - 3$

5) $f(x) = \frac{x}{-3x-9}$

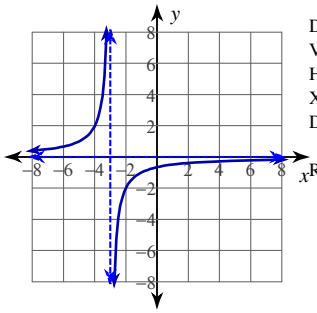
6) $f(x) = \frac{x+2}{x^2+x-6}$

7) $f(x) = \frac{3x-12}{x^2-2x-3}$

8) $f(x) = \frac{-x+1}{x-3}$

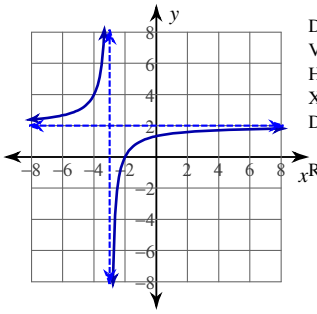
Answers to 12-04-26-T10 rational functions

1)



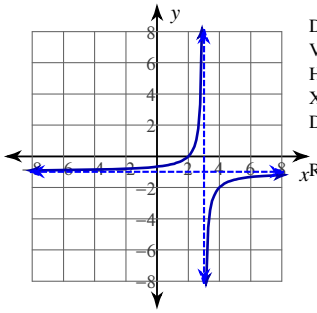
Discontinuities: -3
Vertical Asym.: $x = -3$
Horz. Asym.: $y = 0$
X-intercepts: None
Domain:
All reals except -3
Range:
All reals except 0

2)



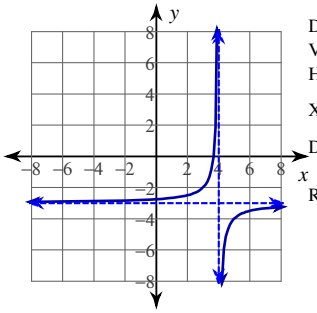
Discontinuities: -3
Vertical Asym.: $x = -3$
Horz. Asym.: $y = 2$
X-intercepts: -2
Domain:
All reals except -3
Range:
All reals except 2

3)



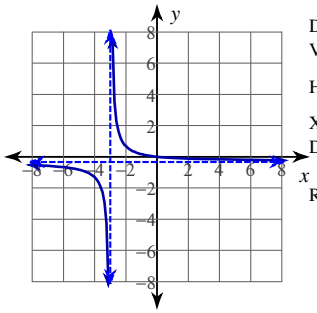
Discontinuities: 3
Vertical Asym.: $x = 3$
Horz. Asym.: $y = -1$
X-intercepts: 2
Domain:
All reals except 3
Range:
All reals except -1

4)



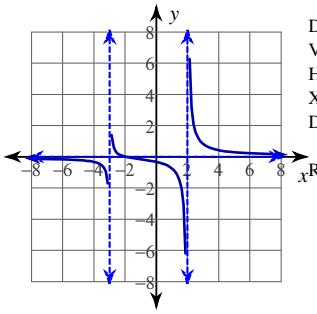
Discontinuities: 4
Vertical Asym.: $x = 4$
Horz. Asym.: $y = -3$
X-intercepts: $\frac{11}{3}$
Domain:
All reals except 4
Range:
All reals except -3

5)



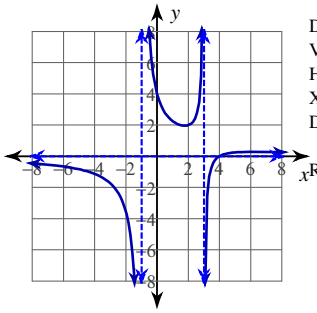
Discontinuities: -3
Vertical Asym.: $x = -3$
Horz. Asym.: $y = -\frac{1}{3}$
X-intercepts: 0
Domain:
All reals except -3
Range:
All reals except $-\frac{1}{3}$

6)



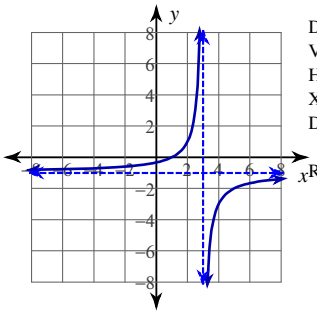
Discontinuities: 2, -3
Vertical Asym.: $x = 2$, $x = -3$
Horz. Asym.: $y = 0$
X-intercepts: -2
Domain:
All reals except 2, -3
Range:
All reals except 0

7)



Discontinuities: 3, -1
Vertical Asym.: $x = 3$, $x = -1$
Horz. Asym.: $y = 0$
X-intercepts: 4
Domain:
All reals except 3, -1
Range:
All reals except 0

8)



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