

Multiple Choice. Please circle the correct answer.

1. What is the horizontal asymptote(s) of $f(x) = \frac{3x^2-x-2}{x^2-3x+2}$?

← Equal Degree
(Divide bc)

$y = \frac{3}{1} \rightarrow y = 3$

2. What is (are) the vertical asymptote(s) of $f(x) = \frac{3x^2-x+2}{x^2-3x+2}$??

can't factor

$\frac{M}{6} \mid \frac{A}{-1}$

$x-2=0 \rightarrow x=2$
 $x-1=0 \rightarrow x=1$

$(x-2)(x-1)$
 $\frac{M}{2} \mid \frac{A}{-3}$
 $-2 \mid 1$

3. What is/are the hole(s) in the graph of $f(x) = \frac{x-4}{2x^2-8x} = \frac{x-4}{2x(x-4)}$

$x-4=0$
 $x=4$

$\frac{1}{2(4)} = \frac{1}{8}$

$(4, \frac{1}{8})$ or $(4, .125)$

4. Find all asymptotes, holes, and intercepts of the following.

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

b) $f(x) = \frac{x^2-2x}{x-5} = \frac{x(x-2)}{x-5}$

c) $f(x) = \frac{x^2+x-20}{x^2+8x+15} = \frac{(x+5)(x-4)}{(x+5)(x+3)}$

HA: $y=0$

HA: NO HA

HA: $y=1$

Holes: none

Holes: none

Holes: $(-5, \frac{9}{2})$

$x+5=0 \rightarrow x=-5$
 $\frac{-5-4}{-5+3} = \frac{-9}{-2}$

VA: $x=-1, x=1$
 $x+1=0 \rightarrow x=-1$
 $x-1=0 \rightarrow x=1$

VA: $x=5$
 $x-5=0 \rightarrow x=5$

VA: $x=-3$
 $x+3=0 \rightarrow x=-3$

X-int: $(0,0)$

X-int: $(0,0), (2,0)$
 $x=0 \rightarrow x-2=0 \rightarrow x=2$

X-int: $x=4$
 $x-4=0 \rightarrow x=4$

Y-int: $(0,0)$

Y-int: $(0,0)$

Y-int: $(0, -\frac{4}{3})$

$\frac{0}{(0)^2-1} = \frac{0}{-1} = 0$

$\frac{(0)^2-2(0)}{0-5} = \frac{0}{-5} = 0$

$\frac{(0)^2+(0)-20}{(0)^2+8(0)+15} = \frac{-20}{15} = -\frac{4}{3}$

5. Graph $f(x) = \frac{x-1}{x^2-16}$. State all asymptotes, holes and intercepts.

HA: $y=0$

Holes: none

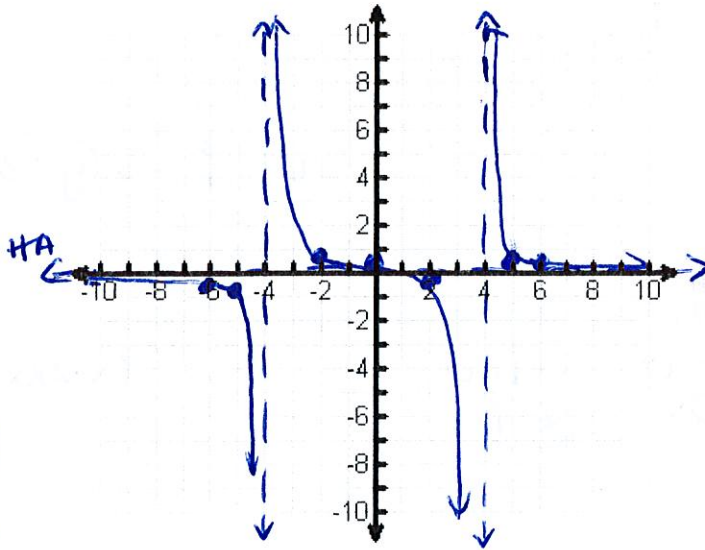
VA: $x=-4$
 $x=4$

$$\begin{aligned} x+4 &= 0 & x &= -4 \\ x-4 &= 0 & x &= 4 \\ x-1 &= 0 & x &= 1 \end{aligned}$$

x-int: $(1, 0)$

y-int: $(0, \frac{1}{16})$ or $(0, .0625)$

$$\frac{0-1}{(0)^2-16} = \frac{-1}{-16} = \frac{1}{16}$$



x	y
-6	-0.35
-5	-.67
-4	Error
-2	.25
0	.0625
-2	-.083
4	Error
5	.44
6	-.25

6. Graph $f(x) = \frac{3x^2+15x}{x^2+3x-10}$. State all asymptotes, holes and intercepts.

HA: $y=3$

Holes: $(-5, \frac{15}{7})$
or $(-5, 2.1)$

$$\begin{aligned} x+5 &= 0 & \frac{3(-5)}{-5-2} \\ x &= -5 & = \frac{-15}{-7} \\ & & = \frac{15}{7} \end{aligned}$$

VA: $x=2$

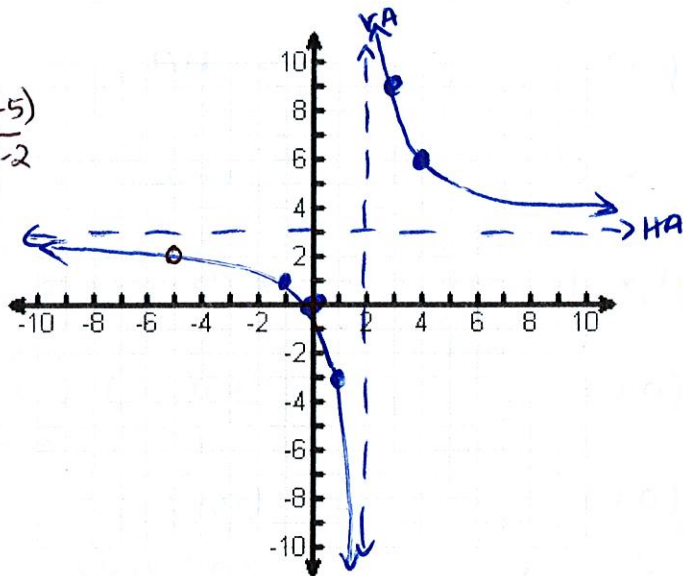
$$\begin{aligned} x-2 &= 0 \\ x &= 2 \end{aligned}$$

x-int: $(0, 0)$

$$\begin{aligned} 3x &= 0 \\ x &= 0 \end{aligned}$$

y-int: $(0, 0)$

$$\frac{3(0)^2+15(0)}{(0)^2+3(0)-10} = \frac{0}{-10} = 0$$



x	y
0	0
1	-3
2	Err.
3	9
4	6

7. Graph $f(x) = \frac{x-1}{x^2-6x+5}$. State all asymptotes, holes and intercepts.

HA: $y=0$

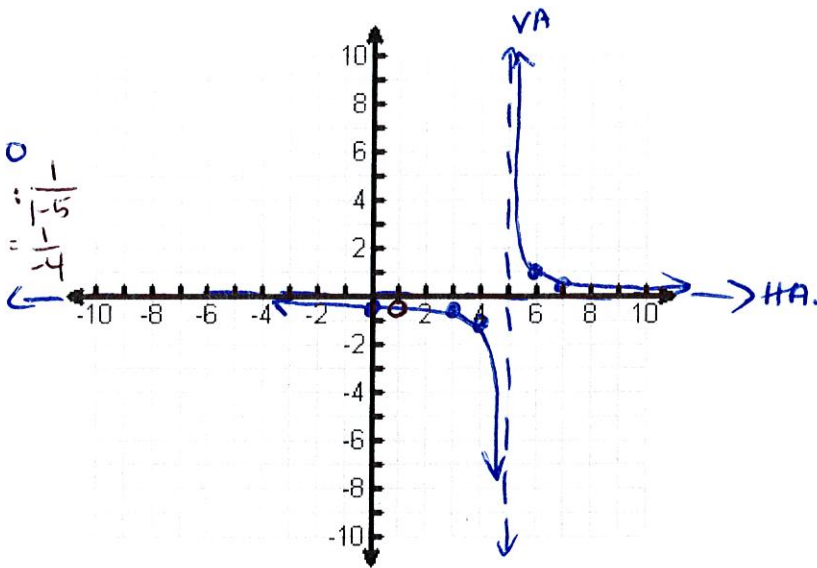
Holes: $(1, -\frac{1}{4})$ $x-1=0$
 $x=1: \frac{1}{1-5} = -\frac{1}{4}$

VA: $x=5$ $x-5=0$
 $x=5$

x-int: none

y-int: $(0, -\frac{1}{5})$

$$\frac{0-1}{(0)^2-6(0)+5} = -\frac{1}{5}$$



x	y
3	-0.5
4	-1
5	ERR.
6	1
7	1.5

8. Graph $f(x) = \frac{2x-1}{x+2}$. State all asymptotes, holes and intercepts.

HA: $y=2$

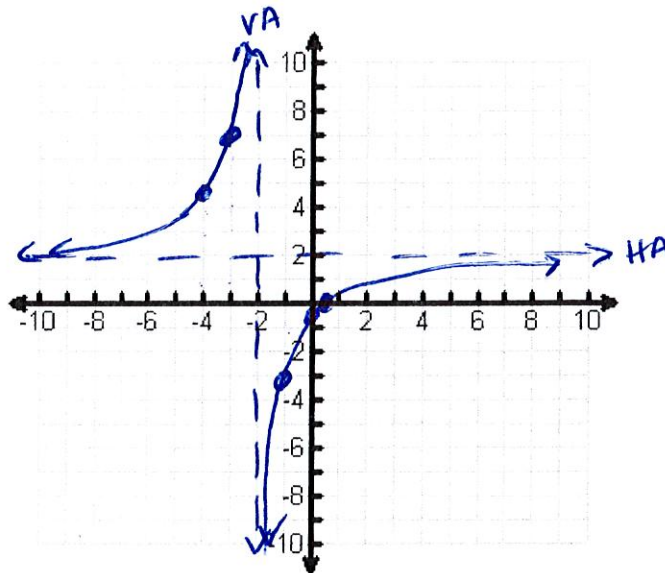
Holes: none

VA: $x=-2$ $x+2=0$
 $x=-2$

x-int: $(\frac{1}{2}, 0)$ $2x-1=0$
 $2x=1$
 $x=\frac{1}{2}$

y-int: $(0, -\frac{1}{2})$

$$\frac{2(0)-1}{0+2} = -\frac{1}{2}$$



x	y
-4	4.5
-3	7
-2	Err.
-1	-3
0	-0.5

200

1. 11/27/80
 2. 11/28/80
 3. 11/29/80
 4. 11/30/80
 5. 12/1/80
 6. 12/2/80
 7. 12/3/80
 8. 12/4/80
 9. 12/5/80
 10. 12/6/80
 11. 12/7/80
 12. 12/8/80
 13. 12/9/80
 14. 12/10/80
 15. 12/11/80
 16. 12/12/80
 17. 12/13/80
 18. 12/14/80
 19. 12/15/80
 20. 12/16/80
 21. 12/17/80
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 25. 12/21/80
 26. 12/22/80
 27. 12/23/80
 28. 12/24/80
 29. 12/25/80
 30. 12/26/80
 31. 12/27/80
 32. 12/28/80
 33. 12/29/80
 34. 12/30/80
 35. 12/31/80

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