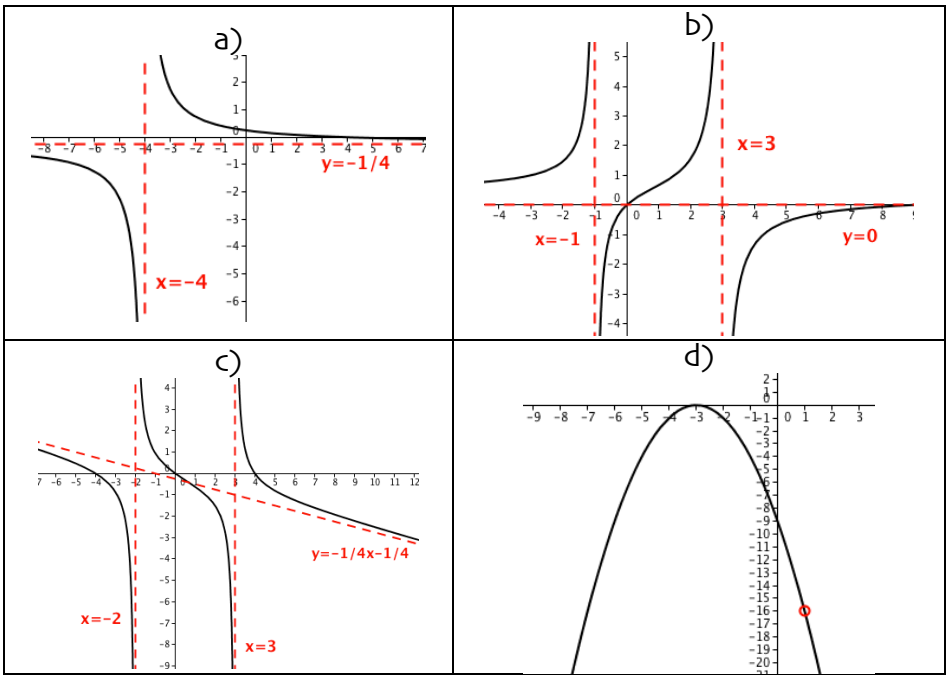
Graphing Rational Functions - WKST 1

I. For each function find:

a) Domain b) Zeros c) Y-intercepts d) Holes e) Asymptotes

1. $f(x)=\frac{5x}{x+2}$	2. $y=\frac{x^2-4}{2x^3-8x}$	3. $g(x)=\frac{4}{(x-5)^2}$	4. $y=\frac{x^4+2x^2}{x^3-1}$
5. $g(x)=\frac{x^2-64}{x-8}$	6. $f(x)=\frac{x^3-4x^2-4x+16}{x^3-5x^2+4x}$	7. $y=\frac{3}{x^2+1}$	

II. Match each function with their graph.



8. $f(x)=\frac{x-4}{-4x-16}$

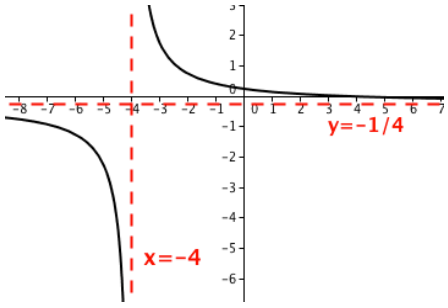
9. $f(x)=\frac{x^3+5x^2+3x-9}{1-x}$

10. $f(x)=\frac{x^3-16x}{-4x^2+4x+24}$

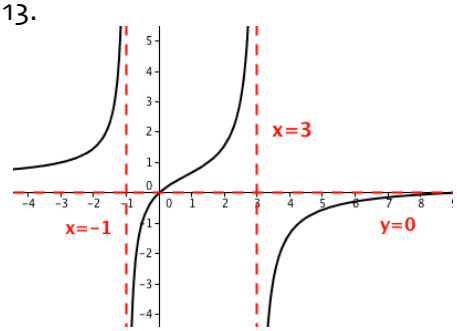
11. $f(x)=\frac{x^2-9x}{3x^2-6x-9}$

III. Given the graph state the end behavior.

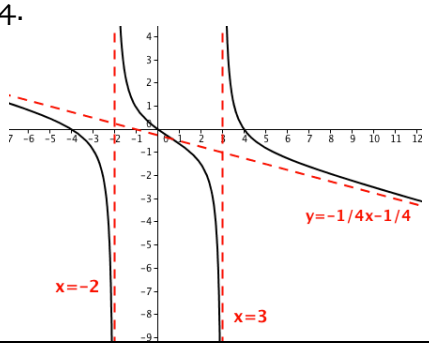
12.



13.



14.



IV. Write an equation of the function with the given characteristics.

15. Zero at x=5, Vertical Asymptote at x=-3, Horizontal Asymptote at y=2

16. Zero at x=0.5, Hole at x=7, Vertical Asymptotes at x=3, x=0, Horizontal Asymptote at y=0.

ANSWERS

1.

a) $\{x\|x \neq -2\}$	b) $x=0$	c) $(0,0)$	d) none	e) HA: $y=5$, VA: $x=-2$, SA: none

2.

a) $\{x\|x \neq \pm 2\}$	b) none	c) none	d) $\left(2,\frac{1}{4}\right)$, $\left(-2,-\frac{1}{4}\right)$	e) HA: $y=0$, VA: $x=0$, SA: none

3.

a) $\{x\|x \neq 5\}$	b) none	c) $\left(0,\frac{4}{25}\right)$	d) none	e) HA: $y=0$, VA: $x=5$, SA: none

4.

a) $\{x\|x \neq 1\}$	b) $x=0$	c) $(0,0)$	d) none	e) HA: none, VA: $x=1$, SA: $y=x$

5.

a) $\{x\|x \neq 8\}$	b) $x=-8$	c) $(0,8)$	d) $(8,16)$	e) HA: none, VA: none, SA: none

6.

a) $\{x\|x \neq 0,1,4\}$	b) $x=\pm 2$	c) none	d) $(4,1)$	e) HA: $y=1$, VA: $x=0$ & $x=1$, SA: none

7.

a) $\{x\|x \in R\}$	b) none	c) $(0,3)$	d) none	e) HA: $y=0$, VA: none, SA: none

8. A
9. D
10. C
11. B
12. $x \to -\infty \quad y \to 1/4$; $x \to \infty \quad y \to 1/4$
13. $x \to -\infty \quad y \to 0$; $x \to \infty \quad y \to 0$
14. $x \to -\infty \quad y \to \infty$; $x \to \infty \quad y \to -\infty$
15. $f(x)=\dfrac{2x-10}{x+3}$
16. $f(x)=\dfrac{2x^3-15x+7}{x^3-10x^2+21x}$