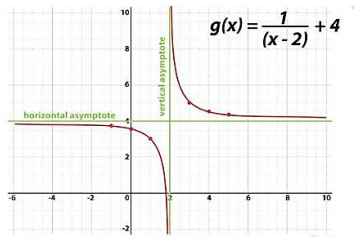
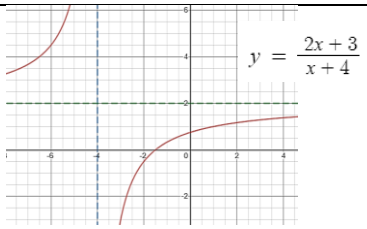
Day 05 Graphing Rational Functions

	Reciprocal Function *Transformation of the parent function*	**Rational Function** *The degree of the numerator and denominator are equal*
Formula/Equation	$y = \frac{a}{x-h} + k$	$y = \frac{ax+b}{cx+d}$
Example		
Vertical Asymptote *Set denominator equal to zero & solve!*	$x = h$ *Shifts horizontally h units*	$cx + d = 0$
Horizontal Asymptote	$y = k$ *Shifts vertically k units*	$y = \frac{a}{c}$
Domain	$(-\infty, h) \cup (h, \infty)$	$(-\infty, -d/c) \cup (-d/c, \infty)$
Range	$(-\infty, k) \cup (k, \infty)$	$(-\infty, a/c) \cup (a/c, \infty)$
	a > 1 Function stretches vertically *0 <a < 1 Function compresses vertically* *a < 1 Function reflects over the x-axis*	

1-6: State the horizontal asymptote, vertical asymptotes, domain, and range of each function.

1. $f(x) = \frac{7}{x-2} - 1$

H.A._____

V.A._____

Domain:_____

Range:_____

2. $f(x) = \frac{1}{x-2} + 7$

H.A._____

V.A._____

Domain:_____

Range:_____

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

H.A._____

V.A._____

Domain:_____

Range:_____

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

H.A._____

V.A._____

Domain:_____

Range:_____

5. $f(x) = \frac{3x-1}{6x-12}$

H.A._____

V.A._____

Domain:_____

Range:_____

6. $f(x) = \frac{2x-1}{x+7}$

H.A._____

V.A._____

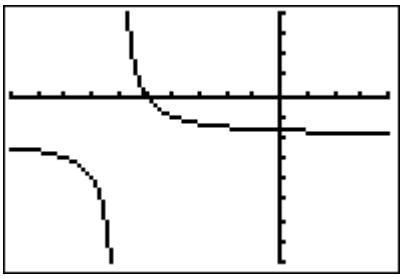
Domain:_____

Range:_____

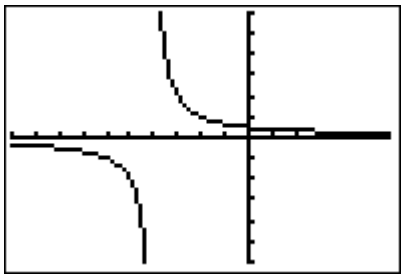
7-9: Match the function with its graph.

____ **7.** $f(x) = \frac{2}{x+4}$ ____ **8.** $f(x) = \frac{6}{x} - 3$ ____ **9.** $f(x) = \frac{2}{x+6} - 2$

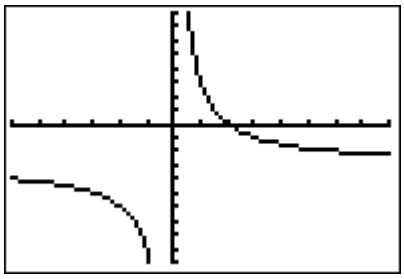
A.



B.

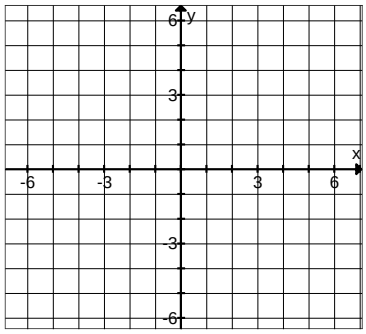


C.



10-13: Graph the following functions. Sketch the asymptotes and at least 2 points on each branch and state all of the parts.

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



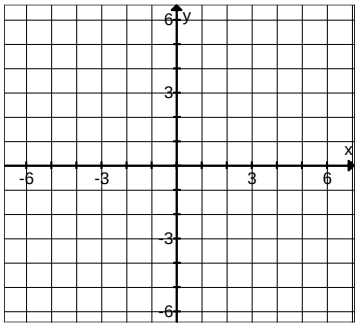
H.A._____

V.A._____

Domain:_____

Range:_____

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



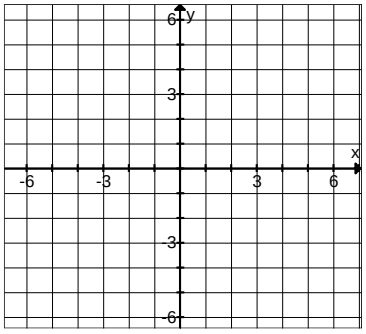
H.A._____

V.A._____

Domain:_____

Range:_____

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



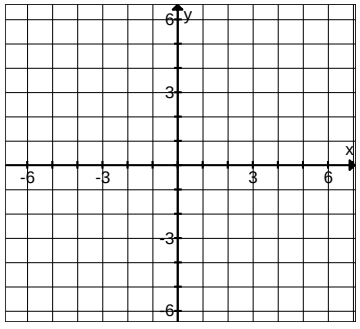
H.A._____

V.A._____

Domain:_____

Range:_____

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



H.A._____

V.A._____

Domain:_____

Range:_____