

5.3 Graphs of the form:  $f(x) = \frac{ax + b}{cx + d}$

**Math Learning Target:**



"I can easily determine horizontal asymptotes when the function is of the above form. Moreover, I can graph functions of the above form."

**Ex.1:** Graph  $y = \frac{6x - 1}{2x - 3}$

Restriction:  $x \neq \frac{3}{2}$

H.A.  $y = \frac{6}{2} = 3$

y-int, let  $x=0$  | x-int, let  $y=0$   
 $f(0) = \frac{-1}{-3} = \frac{1}{3}$  |  $0 = \frac{6x-1}{2x-3}$   
 $0(2x-3) = 6x-1$

$0 = 6x - 1$   
 $x = \frac{1}{6}$

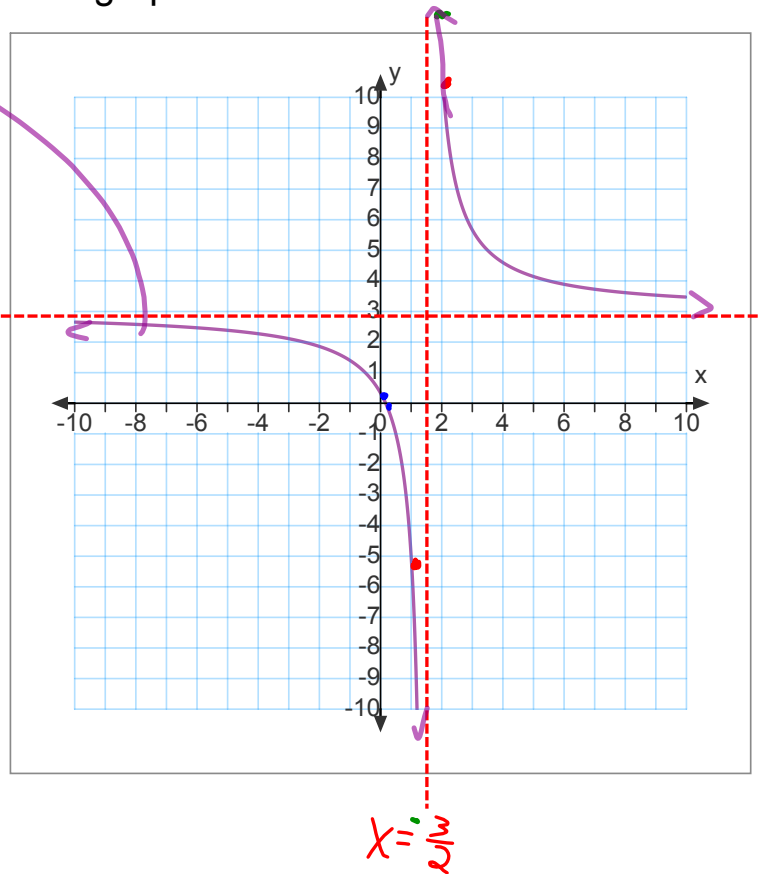
$f(1.51) = 403$

$f(1.49) = -397$

$f(1) = \frac{6(1)-1}{2(1)-3} = \frac{5}{-1} = -5$

$f(2) = \frac{6(2)-1}{2(2)-3} = \frac{11}{1} = 11$

$f(-100) = \frac{-601}{-203} \approx 2.96$  |  $f(100) = \frac{599}{197} \approx 3.04$



**Do:** p. 272 #1, 5ad, 6, 8\*, 9, 10\*\*.

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**Answers that need to be corrected in the text:**

8\*  $f(x)$  has a VA at  $x=1$ ;  $g(x)$  has a HA at  $y=0.5$ .

Also,  $f(x)$  has a HA at  $y=3$ ;  $g(x)$  has a VA at  $x=-1.5$

10\*\* The concentration increases over the 24 h period and approaches approx. 1.85 mg/L

14\*\*\*a)  $f(x)$  and  $m(x)$

b)  $g(x)$