

No Calculators!

1. Given $h(x) = \frac{(x-1)(x+2)}{(2x-1)}$

a. Find the vertical asymptote(s)

$x = \frac{1}{2}$

b. Find the oblique asymptote.

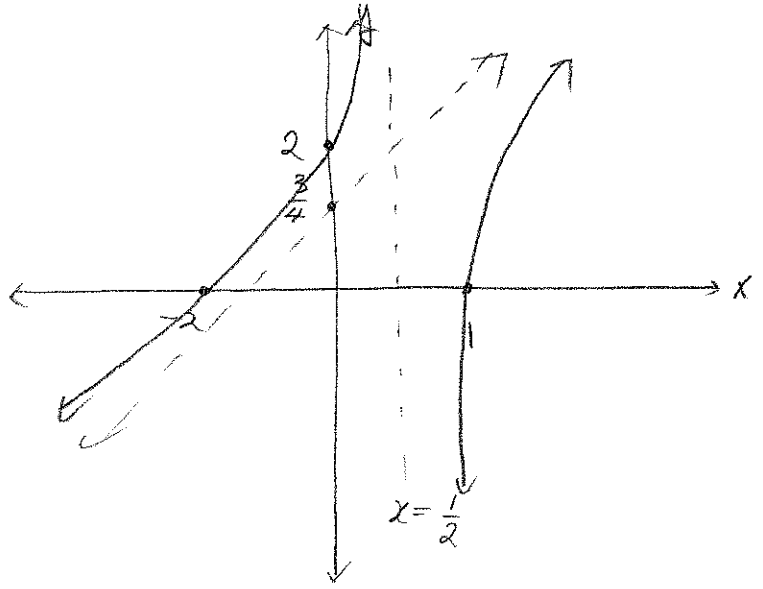
$y = \frac{1}{2}x + \frac{3}{4}$

c. Find x-intercept(s) and y-intercept.

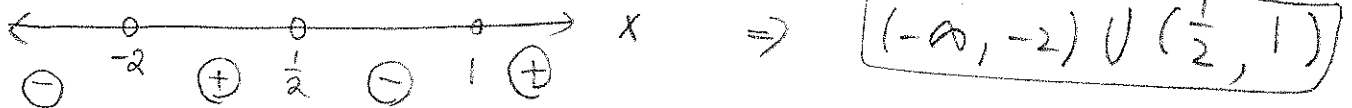
x: (1, 0) (-2, 0)

y: (2, 0)

d. Sketch the graph using the answers of a-c.



2. Make a sign diagram for $h(x) = \frac{(x-1)(x+2)}{(2x-1)}$ and then solve $\frac{(x-1)(x+2)}{(2x-1)} < 0$



3. For the function $f(x) = \frac{-6x^2 - 3x + 18}{2x^2 - 5x + 3} = \frac{-3(2x-3)(x+2)}{(2x-3)(x-1)}$

a) State the domain and the range.

D: $\{x \in \mathbb{R} \mid x \neq \frac{3}{2}, x \neq 1\}$ R: $\{y \in \mathbb{R} \mid y \neq -3\}$

b) Describe the end behaviors for $f(x)$ $x \rightarrow \infty$ and $x \rightarrow -\infty$.

as $x \rightarrow \infty$, $y \rightarrow -3$

as $x \rightarrow -\infty$, $y \rightarrow -3$

H.A: $y = -3$

c) Describe the transformation of $f(x)$ from $y = \frac{1}{x}$.

$y = -3 + \frac{-9}{x-1} \Rightarrow$ (Vertical Dilation by Factor of 9) / H.T: 1 unit Right
 Deflection over x-axis
 V.T: 3 units down

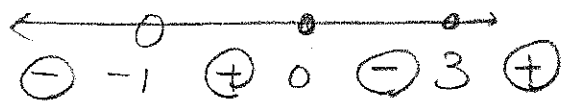
4. Solve $\frac{3x-1}{x+1} \leq x-1$. Support your answers by sign diagram.

$x = -1$ $x = 0$ $x = 3$

$$\frac{3x-1}{x+1} - \frac{(x-1)(x+1)}{(x+1)} \leq 0$$

$$\frac{(3x-1) - (x^2-1)}{x+1} \leq 0$$

$$\frac{x(x-3)}{x+1} \geq 0$$



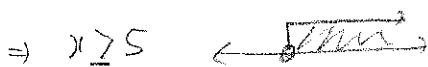
$(-1, 0] \cup [3, \infty)$

5. Given $|x-5| \leq x+1$

a) Solve analytically

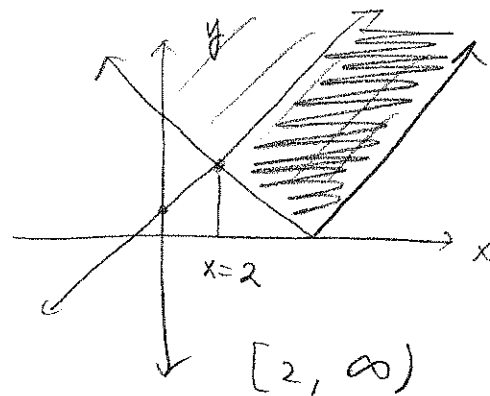
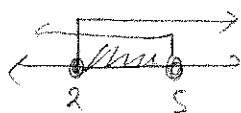
b) Solve graphically (Use G calculator)

$x > 5$ $x-5 \leq x+1 \Rightarrow \mathbb{R} = x$
 $-5 \leq 1$



$\Rightarrow [2, \infty)$

$x < 5$ $-x+5 \leq x+1 \Rightarrow$
 $x \geq 2$

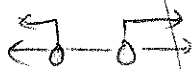


6. Given $\frac{2x+1}{|x+2|} > 3$

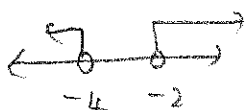
a) Solve analytically

b) Solve graphically (Use G calculator)

$x < -2 \Rightarrow 2x+1 > -3(x+2) \Rightarrow x > +1$
 No solution



$x > -2 \Rightarrow 2x+1 > 3(x+2)$
 $x < -4$
 No solution



\Rightarrow
 No solution

