

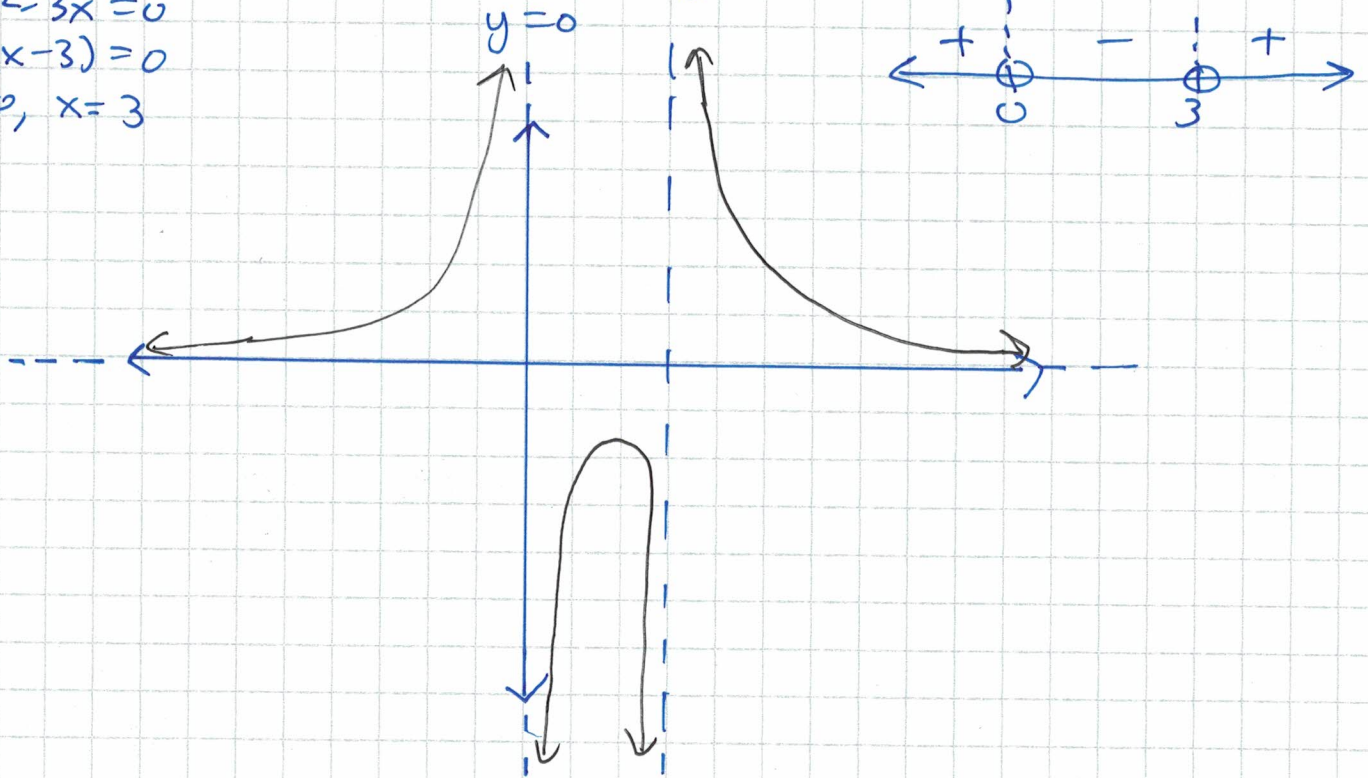
$$1) f(x) = \frac{4}{x^2 - 3x}$$

x-int: top=0
 $y=0$
 NONE

y-int! Plug x=0
 $y = \frac{4}{(0)^2 - 3(0)} = \frac{4}{0}$ NONE

V.A: Bot=0
 $x^2 - 3x = 0$
 $x(x-3) = 0$
 $x=0, x=3$

H.A: deg(top) < deg(bot)



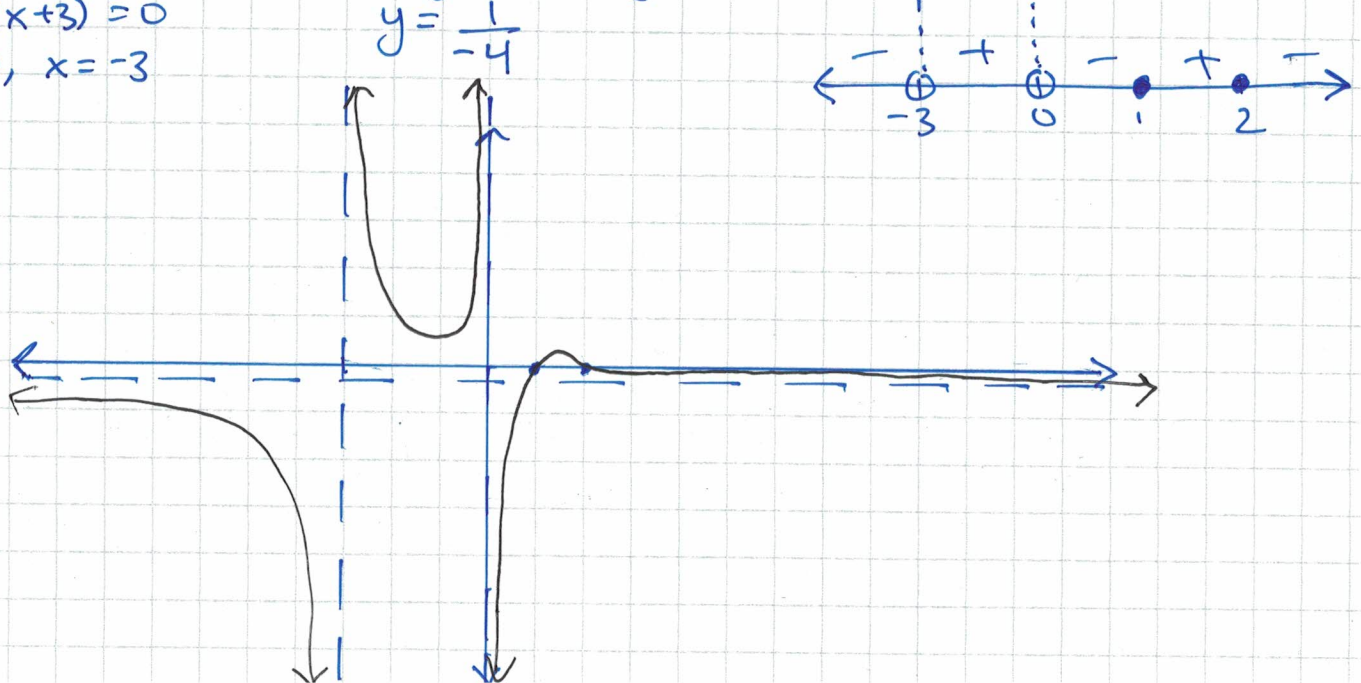
$$2) f(x) = \frac{x^2 - 3x + 2}{-4x^2 - 12x} = \frac{(x-2)(x-1)}{-4x(x+3)}$$

x-int: top=0
 $(x-2)(x-1) = 0$
 $x=2, x=1$

y-int! plug x=0
 $y = \frac{(0)^2 - 3(0) + 2}{-4(0)^2 - 12(0)}$
 $= \frac{2}{0}$ NONE

V.A: Bot=0
 $-4x(x+3) = 0$
 $x=0, x=-3$

H.A: deg(top) = deg(bot)



$$3) f(x) = \frac{x^3 - 16x}{2x^2 - 18} = \frac{x(x^2 - 16)}{2(x^2 - 9)} = \frac{x(x-4)(x+4)}{2(x-3)(x+3)}$$

X-int: top = 0
 $x(x-4)(x+4) = 0$
 $x=0, x=4, x=-4$

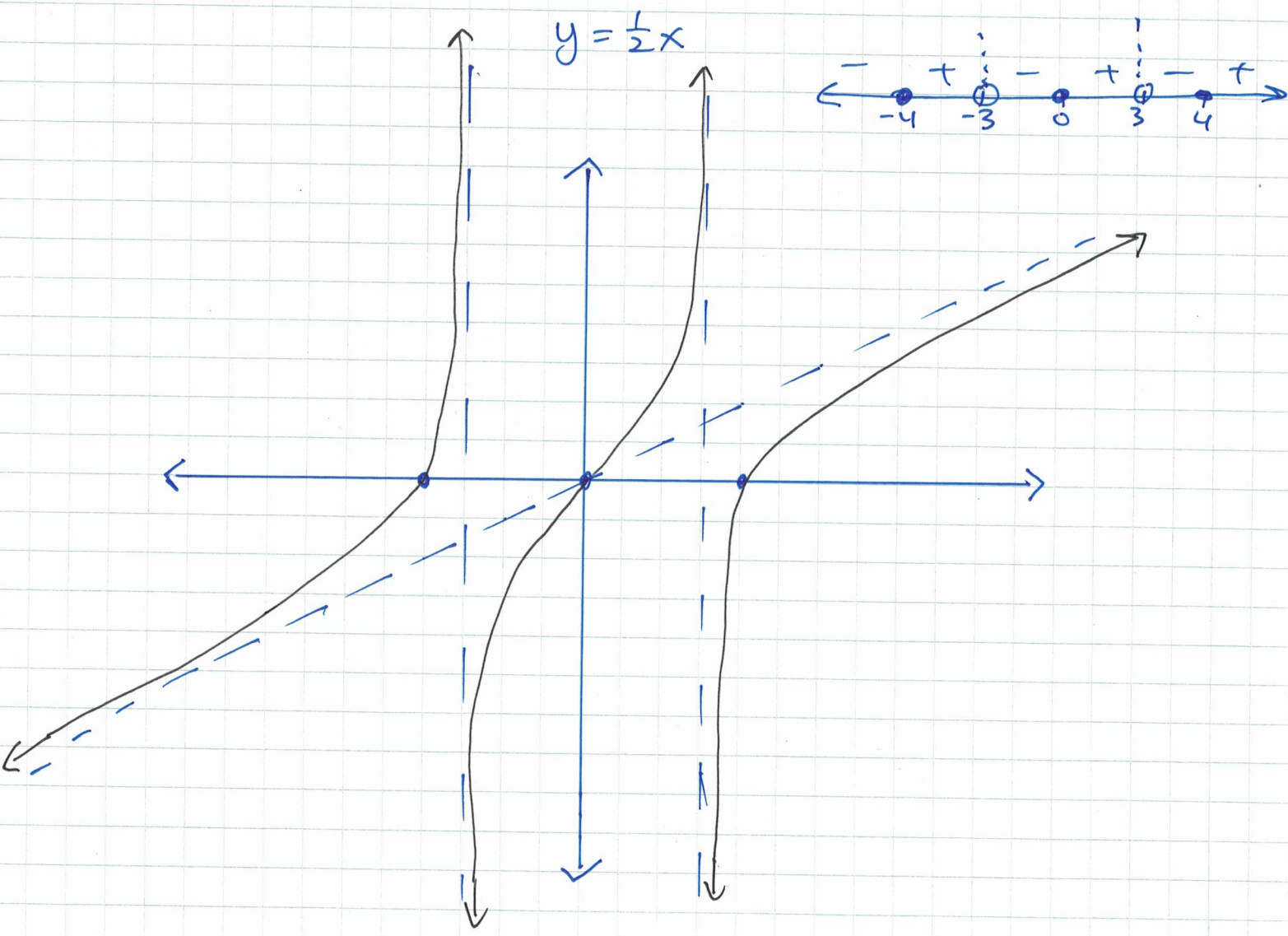
y-int: plug x=0
 $y = \frac{(0)^3 - 16(0)}{2(0)^2 - 18} = \frac{0}{-18} = 0$
 $y=0$

V.A: Bot = 0
 $2(x-3)(x+3) = 0$
~~2~~ $x=3, x=-3$

H.A: deg(top) > deg(bot)
 NONE.

S.A: Divide

$$\begin{array}{r} \frac{1}{2}x \\ 2x^2 - 18 \overline{) x^3 + 0x^2 + 16x + 0} \\ \underline{-(x^3 + 0x^2 - 9x)} \\ -7x + 0 \end{array}$$



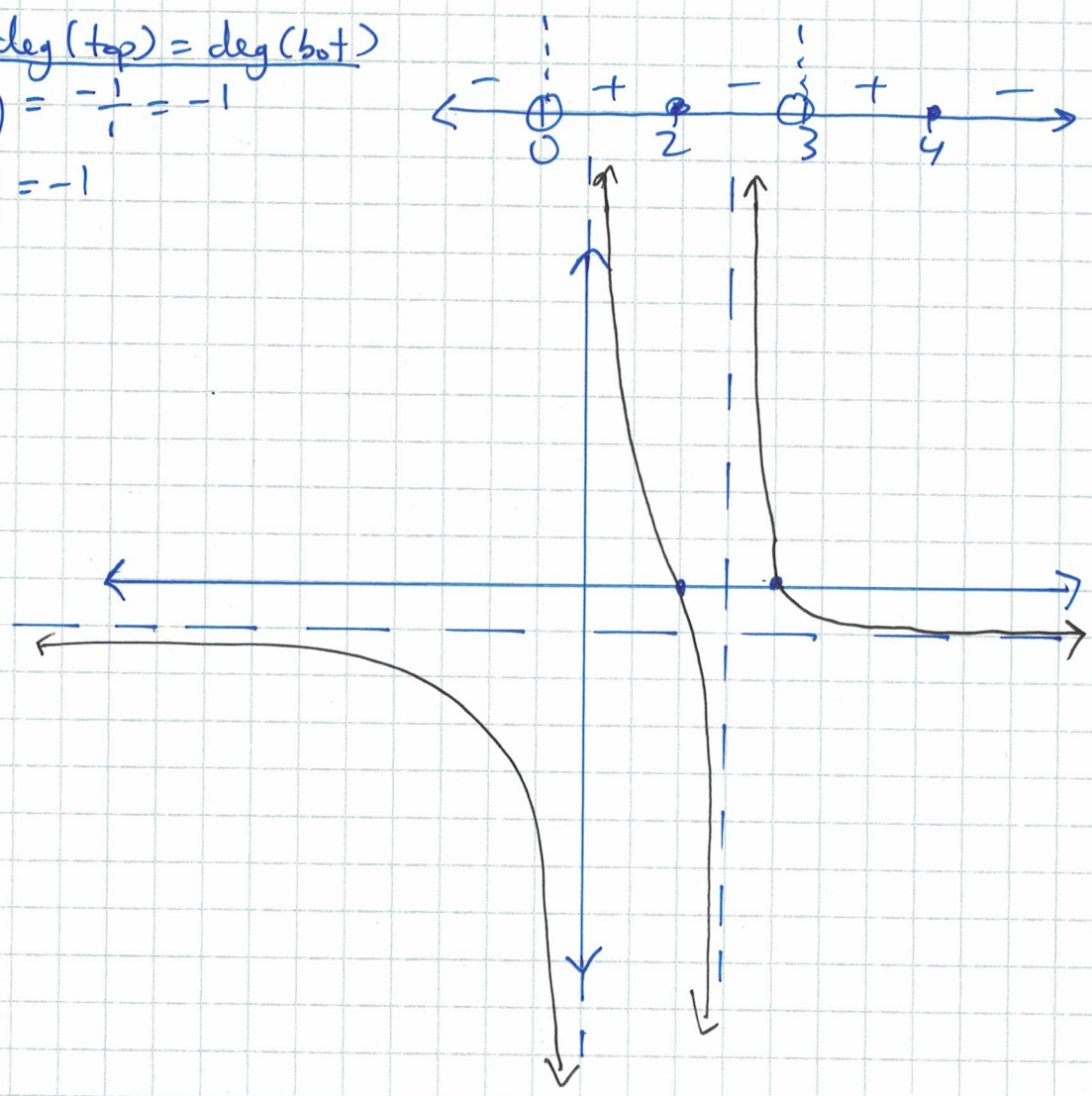
$$4) f(x) = \frac{-x^2 + 6x - 8}{x^2 - 3x} = \frac{-(x^2 - 6x + 8)}{x(x-3)} = \frac{-(x-4)(x-2)}{x(x-3)}$$

X-int: top = 0
 $-(x-4)(x-2) = 0$
 $x=4, x=2$

y-int: plug x=0
 $y = \frac{-(0)^2 + 6(0) - 8}{(0)^2 - 3(0)} = \frac{-8}{0}$
 NONE

V.A: Bot = 0
 $x(x-3) = 0$
 $x=0, x=3$

H.A: deg(top) = deg(bot)
 $y = -\frac{1}{1} = -1$
 $y = -1$



$$5) f(x) = \frac{x^2 - 6x + 1}{x - 2} \quad \leftarrow \text{Cannot factor.}$$

Xint: top = 0
 $x^2 - 6x + 1 = 0$

$$x^2 - 6x + 9 = -1 + 9$$

$$(x - 3)^2 = 8$$

$$x - 3 = \pm 2\sqrt{2}$$

$$x = 3 \pm 2\sqrt{2}$$

$$x \approx .172, x \approx 5.828$$

yint: plug x=0

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

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

$$y = -\frac{1}{2}$$

V.A: Bot = 0

$$x - 2 = 0$$

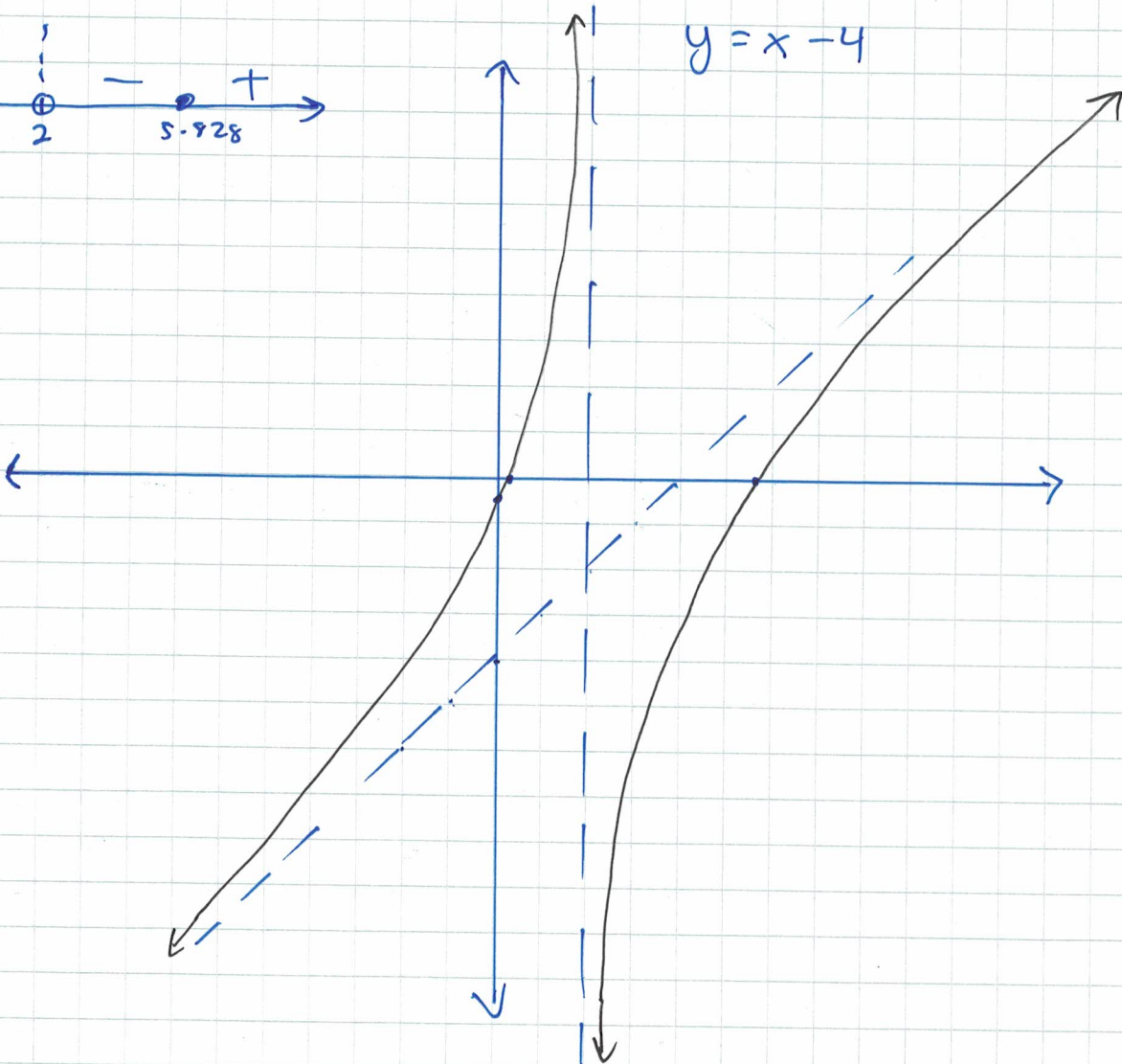
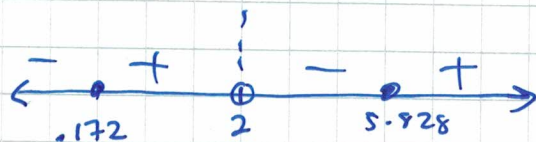
$$x = 2$$

H.A: deg(~~top~~) > deg(bot)
 NONE

S.A: DIVIDE

$$\begin{array}{r|rrr} 2 & 1 & -6 & 1 \\ & \downarrow & 2 & -8 \\ \hline & 1 & -4 & -7 \end{array}$$

$$y = x - 4$$



$$6) f(x) = \frac{x^2 + x}{-2x^2 + 2x} = \frac{\cancel{x}(x+1)}{-2\cancel{x}(x-1)} = \boxed{\frac{x+1}{-2(x-1)}}, x \neq 0$$

X.int: top=0
 $x+1=0$
 $x=-1$

y.int: Plug x=0
 $y = \frac{(0)+1}{-2(0-1)} = \frac{1}{2}$

V.A: Bot=0
 $-2(x-1)=0$
 $x=1$

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

← No y-int.
 It's a hole instead.

H.A. deg(top) = deg(bot)
 $y = -\frac{1}{2}$

Hole @ x=0
 $y = \frac{(0)+1}{-2(0-1)} = \frac{1}{2}, (0, \frac{1}{2})$

