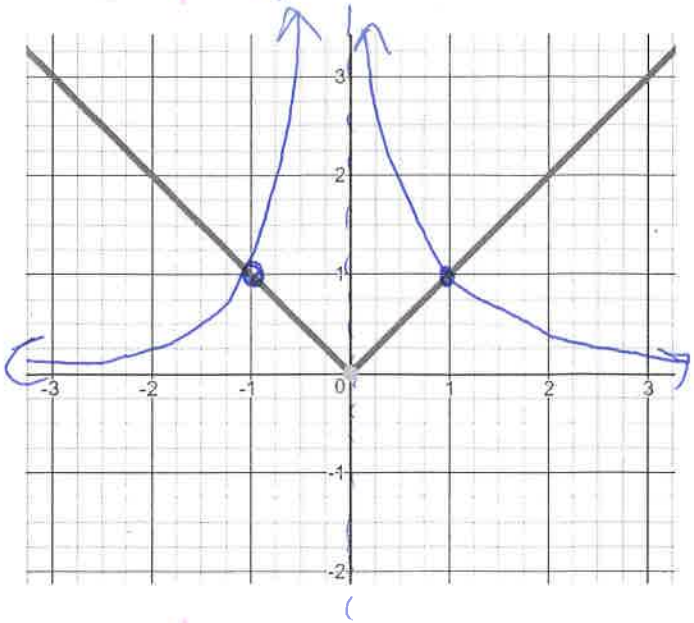
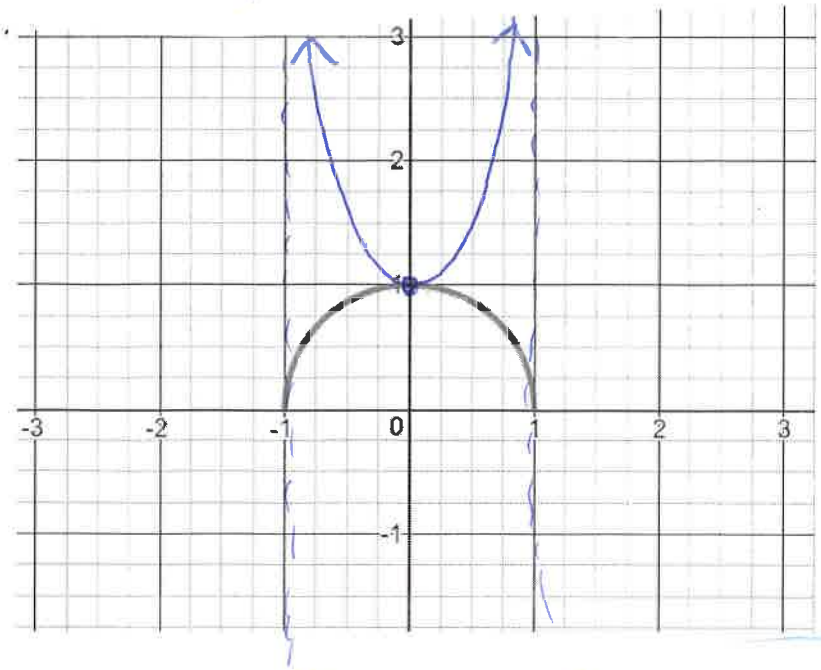
1.

a)



$x=0$

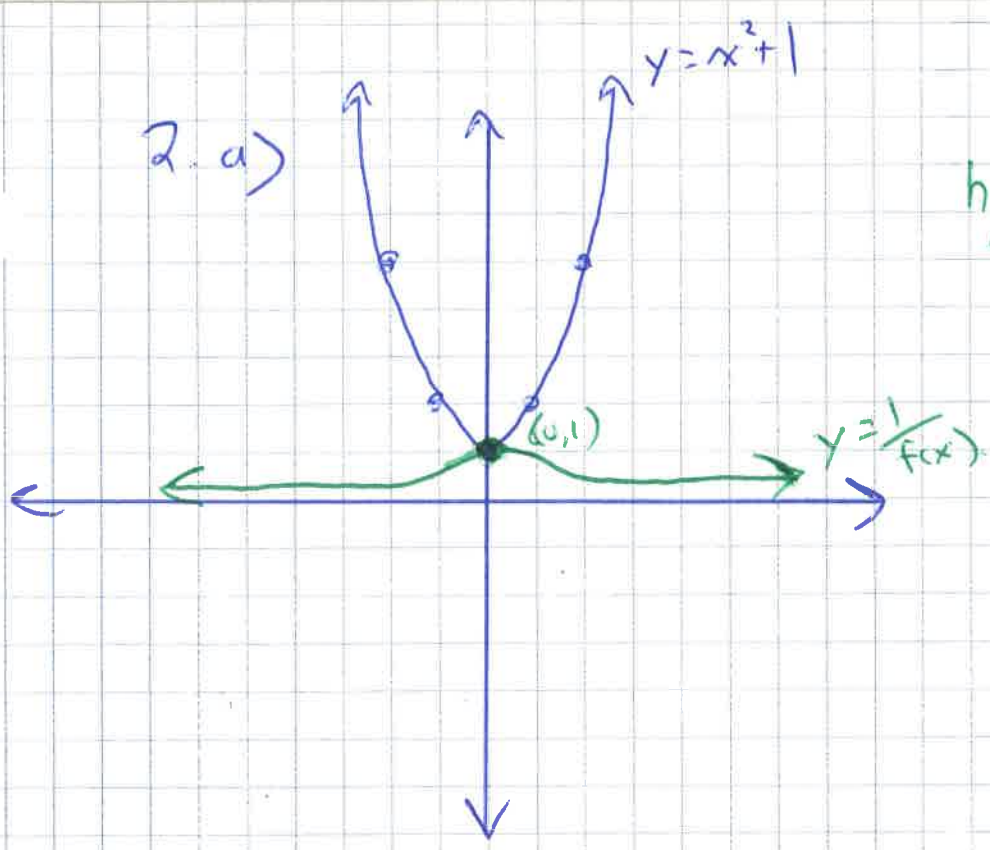
b)



$x=1$ $x=1$

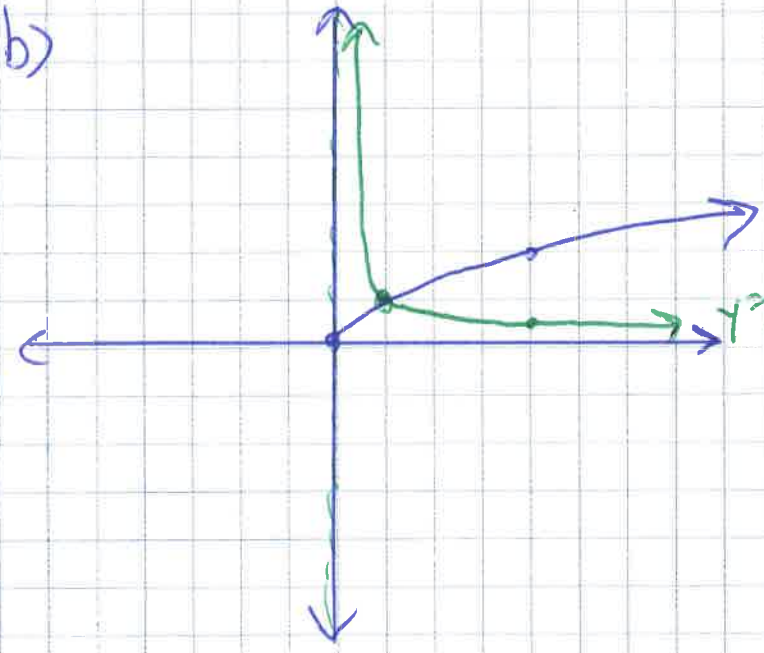
(#2 on next page).

2. a)



horizontal asymptote at $y = 0$

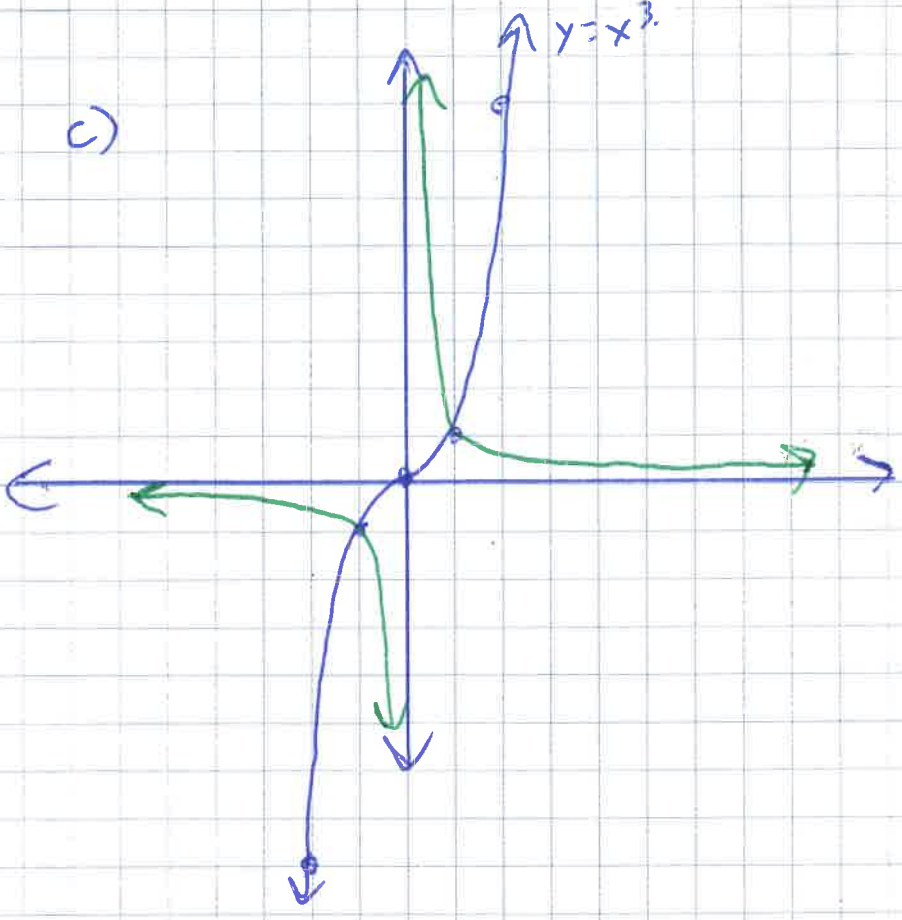
b)



vertical asymptote at $x = 0$

horizontal asymptote at $y = 0$

c)



vertical asymptote at $x = 0$

horizontal asymptote at $y = 0$.

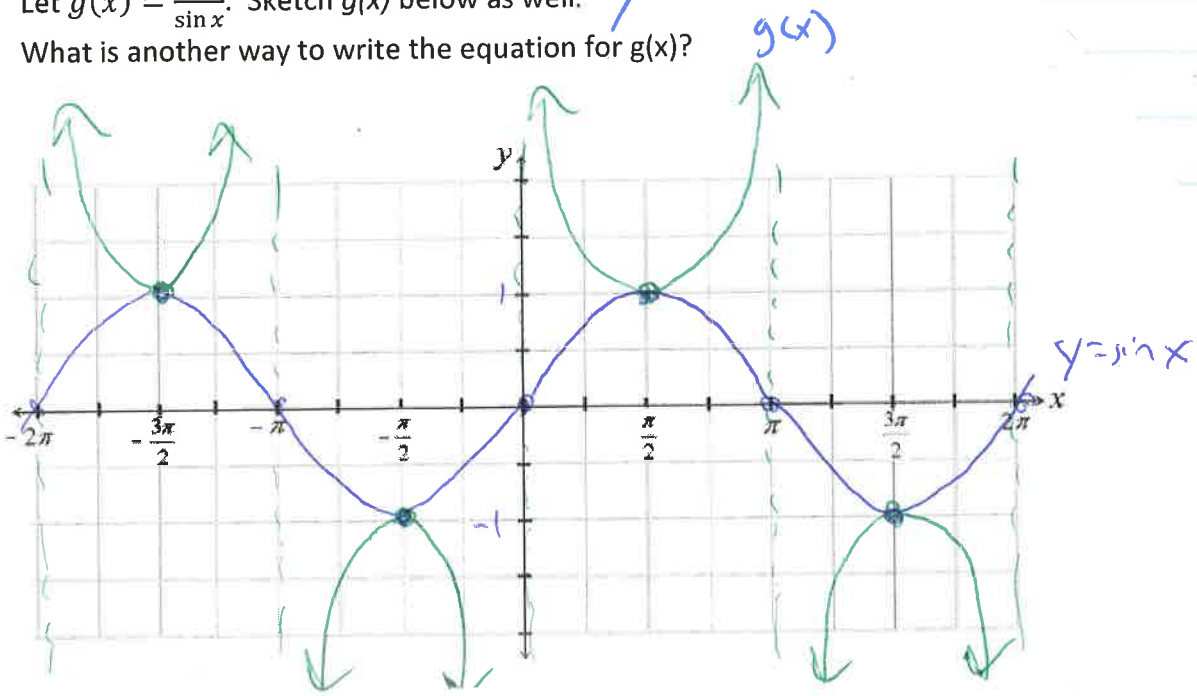
3. Let $f(x) = \sin x$ (with x in radians, of course!!!)

a) Sketch 2 cycles of the graph of *f(x)* below.

b) Let $g(x) = \frac{1}{\sin x}$. Sketch *g(x)* below as well.

c) What is another way to write the equation for g(x)?

$g(x) = \csc x$



4. $f(x) = x^3 - x^2 - x + 1$

$\lim_{x \to \pm\infty} f(x) = \pm\infty$

$f(0) = 1$

$0 = x^3 - x^2 - x + 1$

$0 = x^2(x-1) - (x-1)$

$0 = (x-1)(x^2-1)$

$0 = (x-1)(x+1)(x+1)$

$0 = (x-1)^2(x+1)$

x-int at $x = 1$ and $x = -1$.

$f'(x) = 3x^2 - 2x - 1$

$f'(x) = 0 \rightarrow \quad 0 = 3x^2 - 2x - 1$

$0 = (3x+1)(x-1)$

$x = -\frac{1}{3} \qquad x = 1$

$(1, 0)$

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

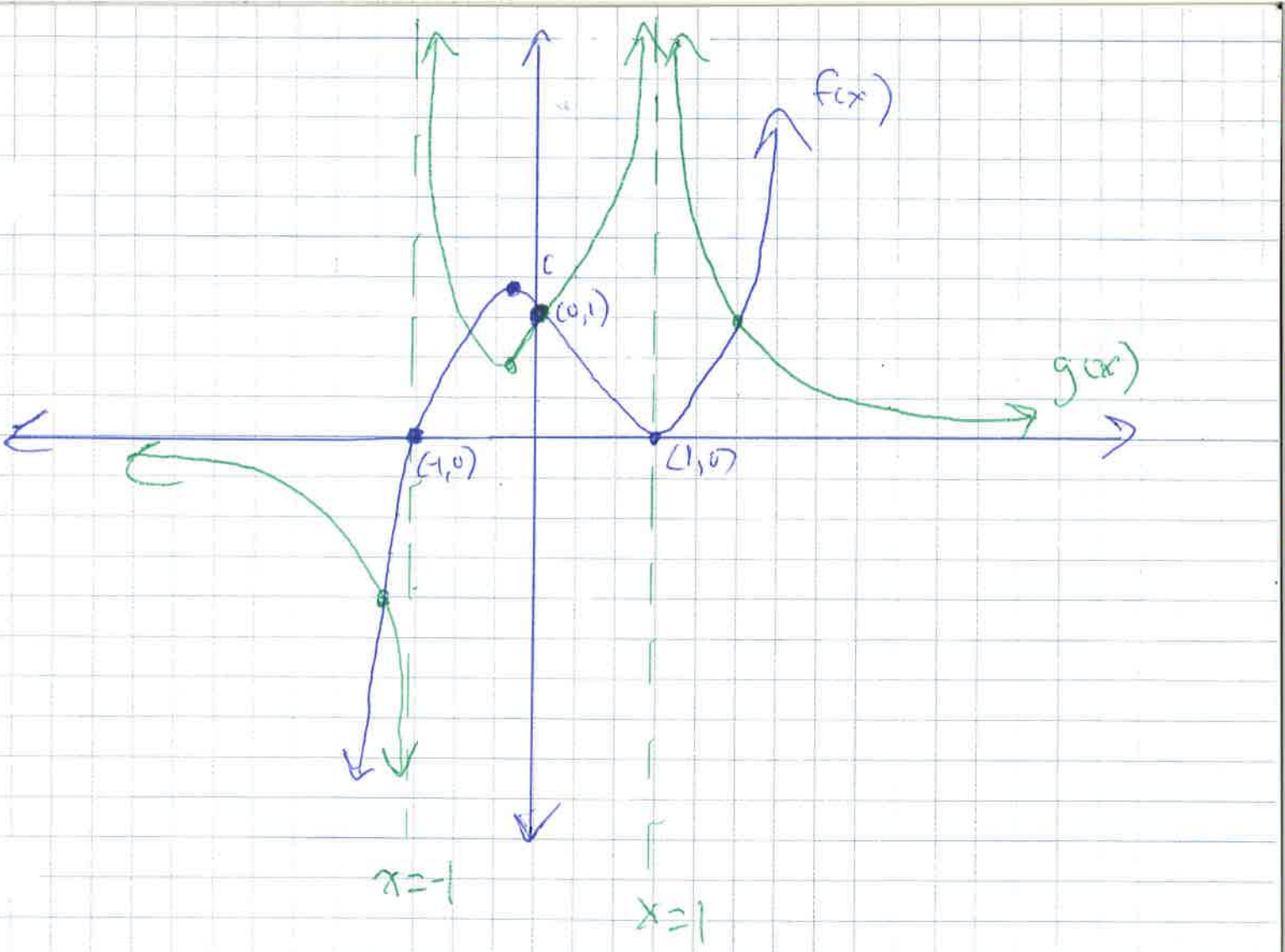
$f(-\frac{1}{3}) = \frac{-1}{27} - \frac{1}{9} + \frac{1}{3} + 1$

$= \frac{-1}{27} - \frac{3}{27} + \frac{9}{27} + \frac{27}{27}$

$= \frac{32}{27}$

critical points are $(-\frac{1}{3}, \frac{32}{27})$ and $(1, 0)$

both are turning points (you can check this).


f(x)
g(x)
(0,1)
(-1,0)
(1,0)
x=-1
x=1