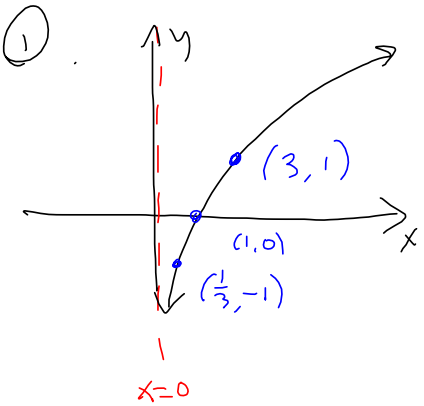
Graph $g(x) = -2\log_3(5x+20)+7$

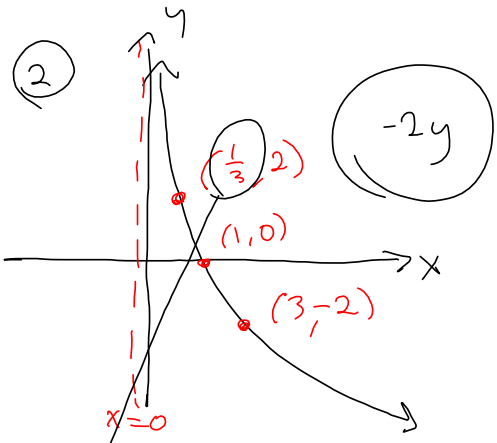
① $\log_3(x)$ ② $-2\log_3(x)$ ③ $-2\log_3(5x)$

④ $-2\log_3(5(x+4))$ ⑤ $-2\log_3(5(x+4))+7$

(from $5x+20 = 5(x+4)$

① 

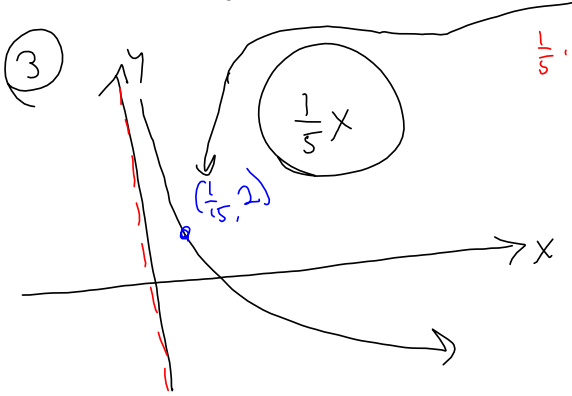
$f(x) = \log_3(x)$

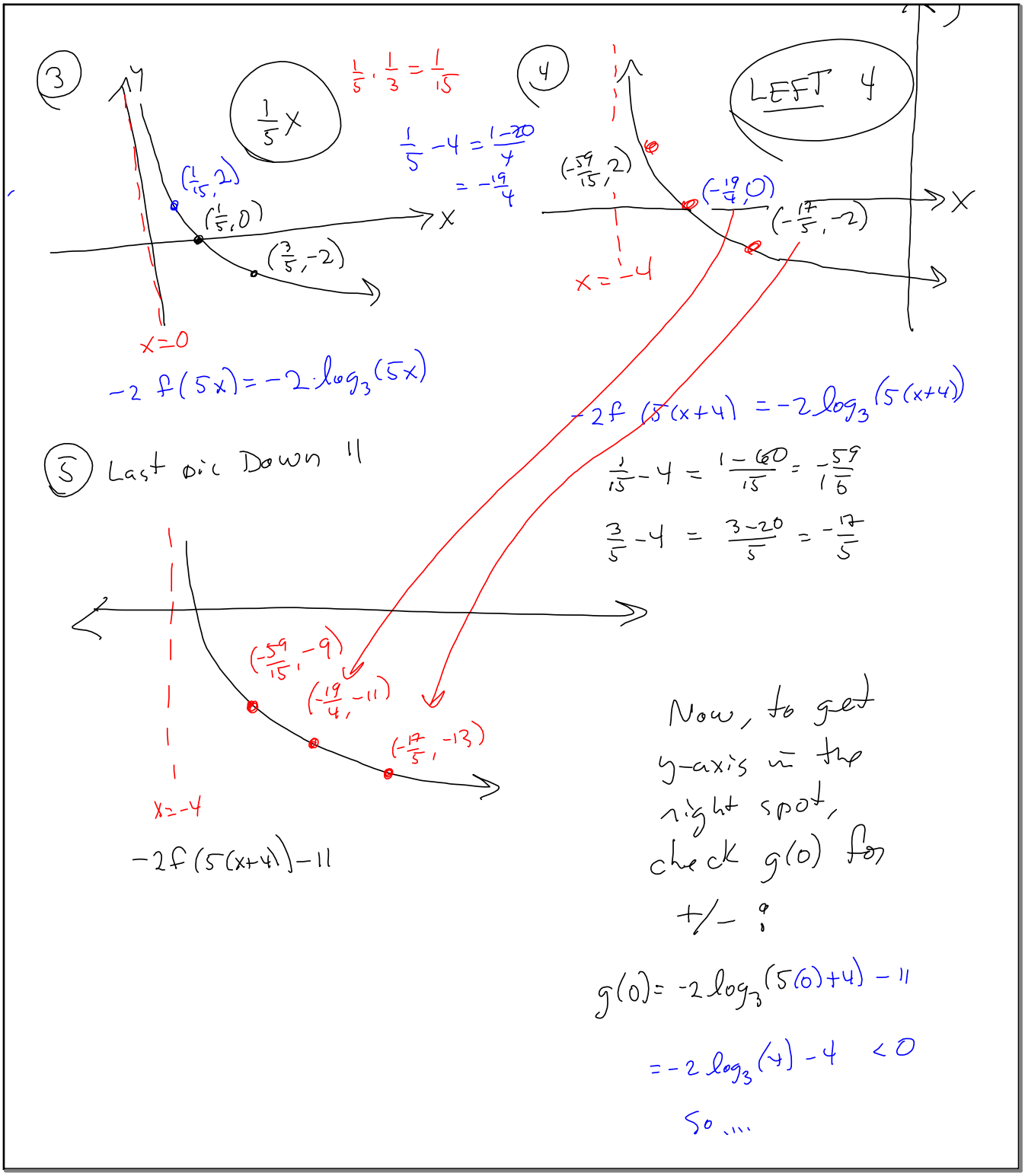
② 

$-2f(x) = -2\log_3(x)$

③ $-2\log_3(5x)$ ④ $-2\log_3(5(x+4))$ ⑤ $-2\log_3(5(x+4))+7$

$\frac{1}{5} \cdot \frac{1}{3} = \frac{1}{15}$

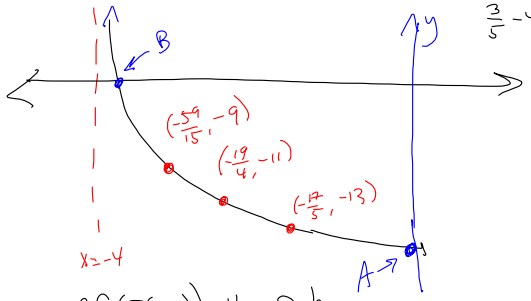
③ 


3
$\frac{1}{5}x$
$\frac{1}{5}\cdot\frac{1}{3}=\frac{1}{15}$
$(\frac{1}{15},2)$
$(\frac{1}{5},0)$
$(\frac{3}{5},-2)$
x
y
x=0
$-2f(5x)=-2\cdot\log_3(5x)$
4
LEFT 4
$\frac{1}{5}-4=\frac{1-20}{4}$
$=-\frac{19}{4}$
$(-\frac{59}{15},2)$
$(-\frac{19}{4},0)$
$(-\frac{17}{5},-2)$
x=-4
$-2f(5(x+4))=-2\log_3(5(x+4))$
$\frac{1}{15}-4=\frac{1-60}{15}=-\frac{59}{15}$
$\frac{3}{5}-4=\frac{3-20}{5}=-\frac{17}{5}$
5 Last pic Down 11
$(-\frac{59}{15},-9)$
$(-\frac{19}{4},-11)$
$(-\frac{17}{5},-13)$
x=-4
$-2f(5(x+4))-11$
Now, to get y-axis in the right spot, check g(0) for +/- ?
$g(0)=-2\log_3(5(0)+4)-11$
$=-2\log_3(4)-4<0$
So ....

(5) Last pic Down 11

$\frac{1}{15} - 4 = \frac{1-60}{15} = -\frac{59}{15}$

$\frac{3}{5} - 4 = \frac{3-20}{5} = -\frac{17}{5}$



$-2f(5(x+4))-11$

Duh. All these guys were to left of y-axis

$A = (0, -2\log_3(20)$

$B = \left(\frac{3^{-\frac{11}{2}}-20}{5}, 0\right)$

Now, to get y-axis in the right spot, check g(0) for +/- ?

$g(0) = -2\log_3(5(0)+20) - 11$

$= -2\log_3(20) - 4 < 0$

So....

overthinking...

But at least got

$A = (0, -2\log_3(20) - 4$

x-int = B:

$g(x) = 0$

$-2\log_3(5x+20) - 11 = 0$

$-2\log_3(5x+20) = 11$

$\log_3(5x+20) = -\frac{11}{2}$

$3^{\log_3(5x+20)} = 3^{-\frac{11}{2}}$

$5x+20 = 3^{-\frac{11}{2}} = \frac{1}{3^{\frac{11}{2}}} = \frac{1}{\sqrt{3^{11}}}$

$5x = 3^{-\frac{11}{2}} - 20$

$x = \frac{3^{-\frac{11}{2}}-20}{5}$

$B = \left(\frac{3^{-\frac{11}{2}}-20}{5}, 0\right)$

$\log_3\left(\frac{1}{3}\right) = \log_3\left(3^{-1}\right) = -1$!

$\log_3(3) = \log_3(3^1) = 1$!