

MTH30

Homework

Section 3.2 / 2, 8, 12, 14, 20, 24, 26, 32, 40, 42, 44, 50, 54, 58

#2

$$6 = \log_2 64$$

$$2^6 = 64$$

#8

$$\log_5 125 = y$$

$$5^y = 125$$

#12

$$5^{-3} = \frac{1}{125}$$

$$\log_5 \frac{1}{125} = -3$$

#14

$$\sqrt[3]{64} = 4$$

$$(64)^{\frac{1}{3}} = 4$$

$$\log_{64} 4 = \frac{1}{3}$$

#20

$$8^y = 300$$

$$\log_8 300 = y$$

#24

$$\log_3 27 = 3$$

$$3^? = 27 = 3^3$$

#26

$$\log_6 \frac{1}{6} = -1$$

$$6^? = \frac{1}{6} = 6^{-1}$$

#32

$$\log_3 \frac{1}{\sqrt{3}} = -\frac{1}{2}$$

$$3^? = \frac{1}{\sqrt{3}} = 3^{-\frac{1}{2}}$$

#40

$$\log_4 4^6 = 6$$

(by properties of logs.
 $\log_b b^x = x$)

#42

$$7^{\log_7 23} = 23 \quad (\text{by properties of logs. } b^{\log_b x} = x)$$

#50

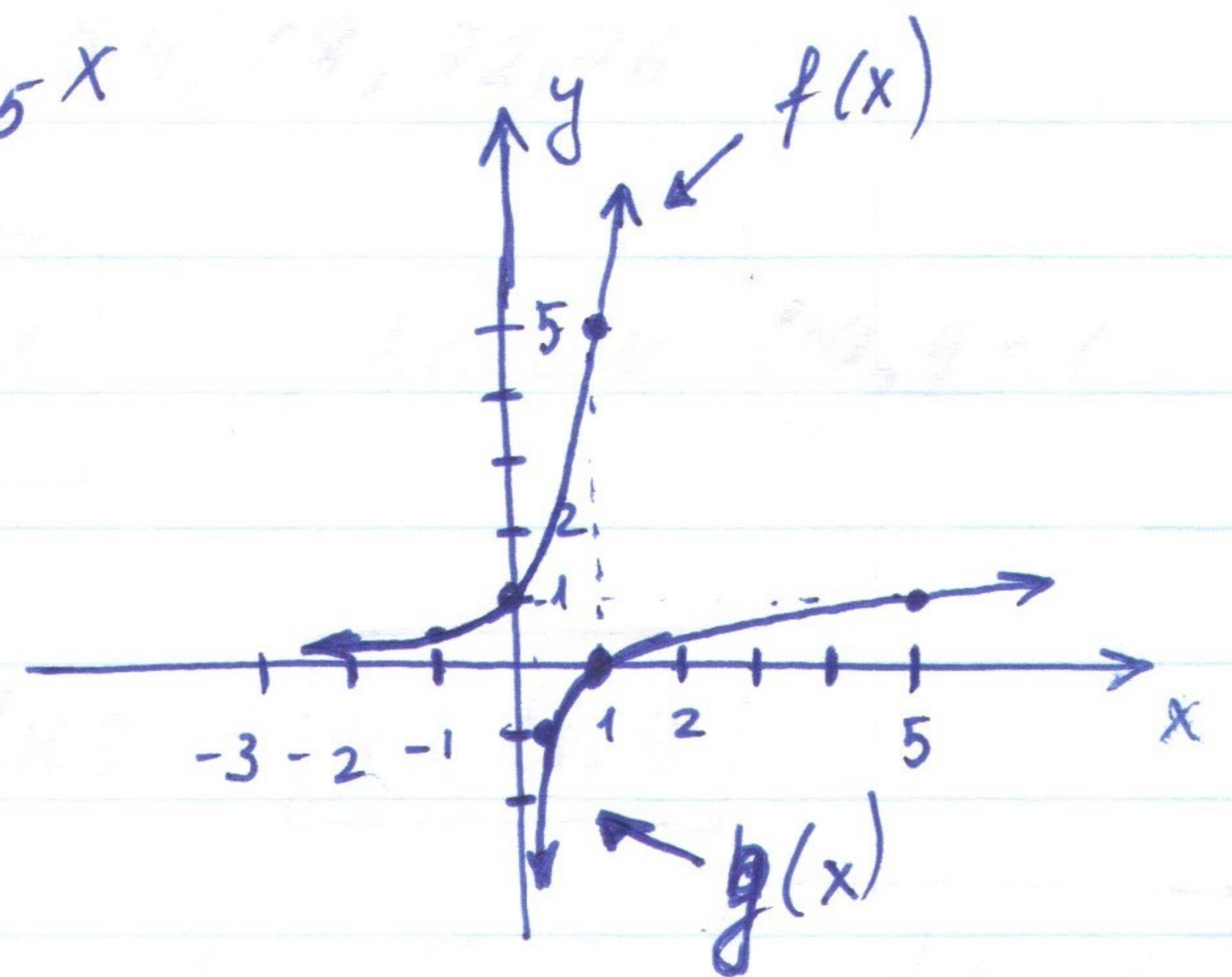
Answer: $F(x) = -\log_3 x$

#44

$f(x) = 5^x$, $g(x) = \log_5 x$

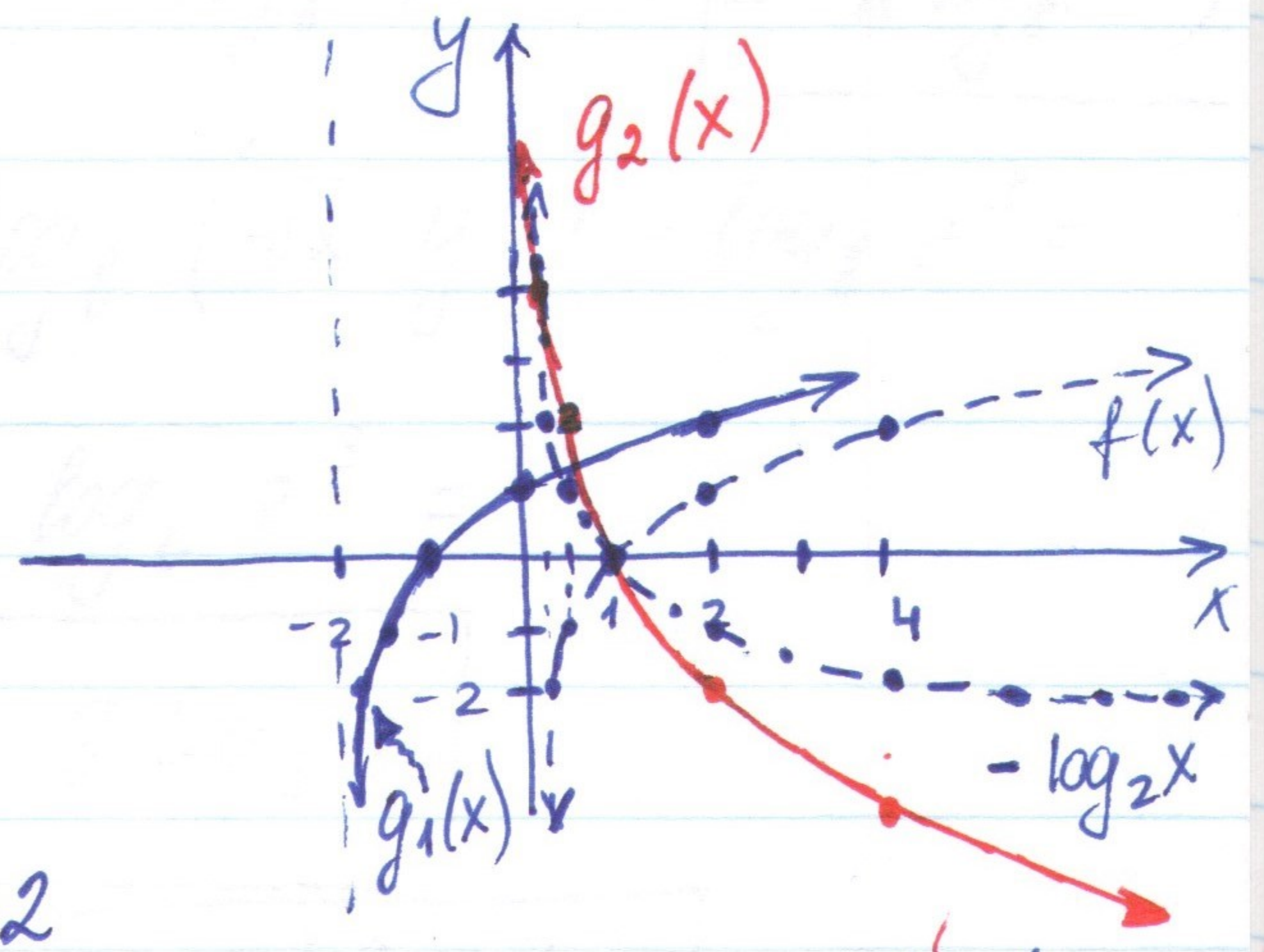
choose value for

x	f(x)	x	g(x)
0	1	$5^0 = 1$	0
1	5	$5^1 = 5$	1
-1	$1/5$	$5^{-1} = 1/5$	-1



#54
#58

$f(x) = \log_2 x$
 $g_1(x) = \log_2 (x+2)$
 $g_2(x) = -2 \log_2 x$



$g_1(x)$ - horizontal shift
2 units left

vertical asymptote: $x = -2$

domain: $(-2, +\infty)$ range: \mathbb{R}

$g_2(x)$ - reflection about x-axis
vertical stretching

$(x, y) \rightarrow (x, 2y)$

vertical asymptote: $x = 0$

domain: $(0, +\infty)$ range: \mathbb{R} .

x	f(x)
$2^0 = 1$	0
$2^1 = 2$	1
$2^{-1} = 1/2$	-1
$2^{-2} = 1/4$	-2
$2^2 = 4$	2