

D4 HW

Chapter 7.1-7.3 Quiz A

Exponential Expert _____

Calculator.

Use the following formulas to answer the problems below.

$$A = P \left(1 + \frac{r}{n} \right)^{nt} \quad A = Pe^{rt} \quad A = P(1+r)^t \quad A = P(1-r)^t$$

- 1.) You buy a commemorative coin for \$110. Each year the value of the coin increases by 4%.

Equation: $A = P(1+r)^t$ $A = 110(1+.04)^t$

How much is the coin worth after 10 years?

$t = 10$

$\$162.83$

- 2.) You buy a stereo system for \$750. Each year the value of the stereo system decreases by 5%.

Equation: $A = P(1-r)^t$ $A = 750(1-.05)^t$

How much is the stereo system worth after 3 years?

$t = 3$

$\$643.03$

- 3.) You deposit \$1600 into a bank account that pays 2.5 % interest compounded continuously.

Equation: $A = Pe^{rt}$ $A = 1600e^{(.025)t}$

What is the balance after 3 years?

$\$1724.61$ $t = 3$

When will the balance reach \$2000.

$t = 9 \text{ yrs}$
trial and error

$2000 = 1600e^{.025t}$
 $1.25 = e^{.025t}$

- 4.) You deposit \$2500 into a bank account that pays 5% interest compounded quarterly.

Equation: $A = 2500 \left(1 + \frac{.05}{4} \right)^{4t}$

What is the balance after 4 years?

$t = 4$ $\$3049.72$

When will the balance reach \$4000.

$t = 12 \text{ yrs}$

$4000 = 2500 \left(1 + \frac{.05}{4} \right)^{4t}$
 $1.6 = 1.0125^{4t}$
guess by trial and error

04 H.W

Chapter 7.1-7.3 Quiz A

Exponential Expert Solution

No Calculator.

Determine if the equation represents an exponential growth or decay. Explain why.

1.) $y = \frac{1}{2}(3)^{x-2}$

Growth

$b > 1$

2.) $y = 3\left(\frac{1}{2}\right)^{x-2}$

Decay

$0 < b < 1$

3.) $y = \frac{1}{3}\left(\frac{2}{3}\right)^{x+4} + 2$

Decay

$0 < b < 1$

4.) $y = \frac{2}{3}\left(\frac{4}{3}\right)^x - 3$

Growth

$b > 1$ (sneaky)

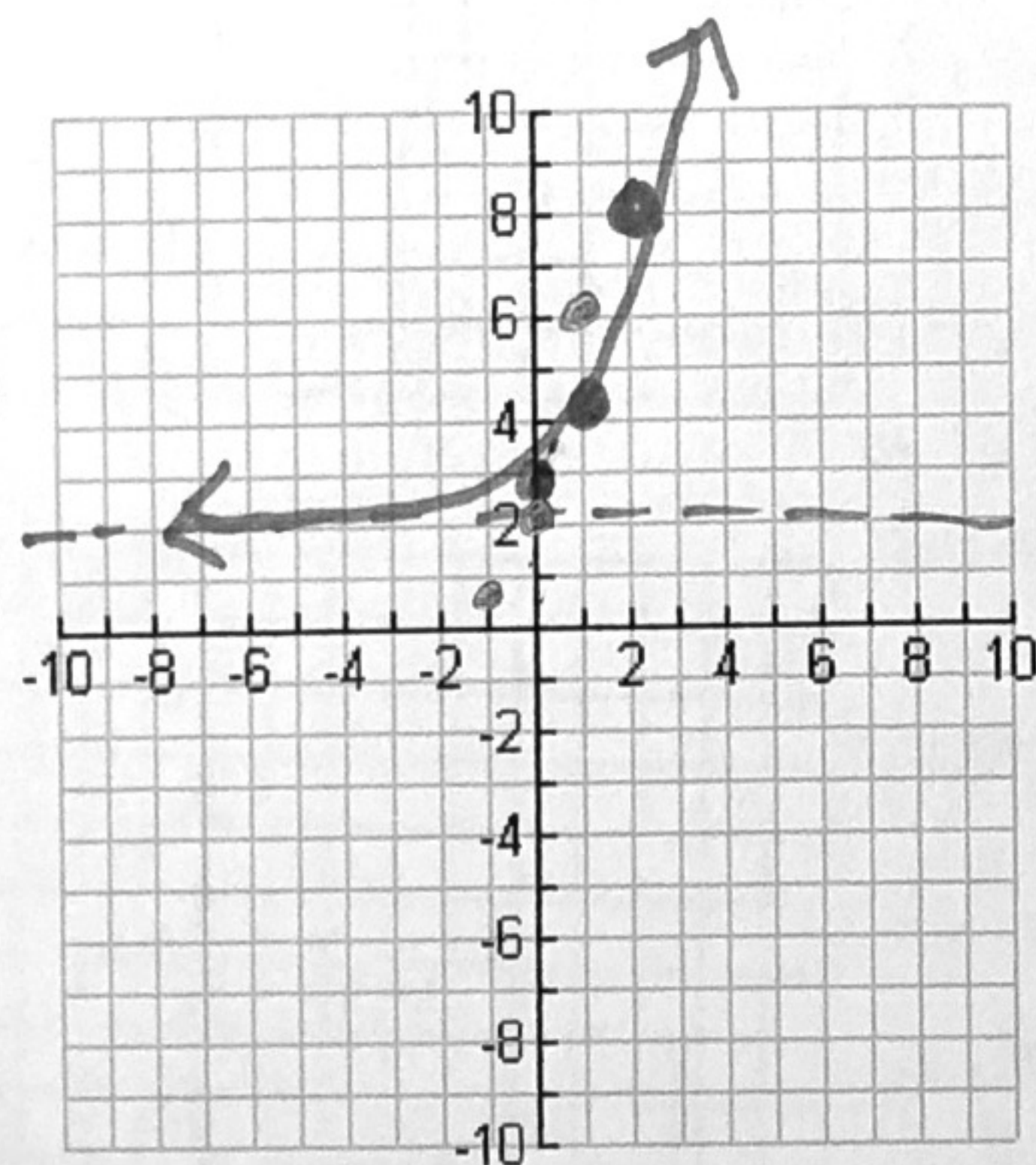
Graph each of the following. Give the equation of the asymptote and state the domain and range. Label at least two points.

5.) $y = 2(3)^{x-1} + 2$

$y = 2 \cdot 3^x$

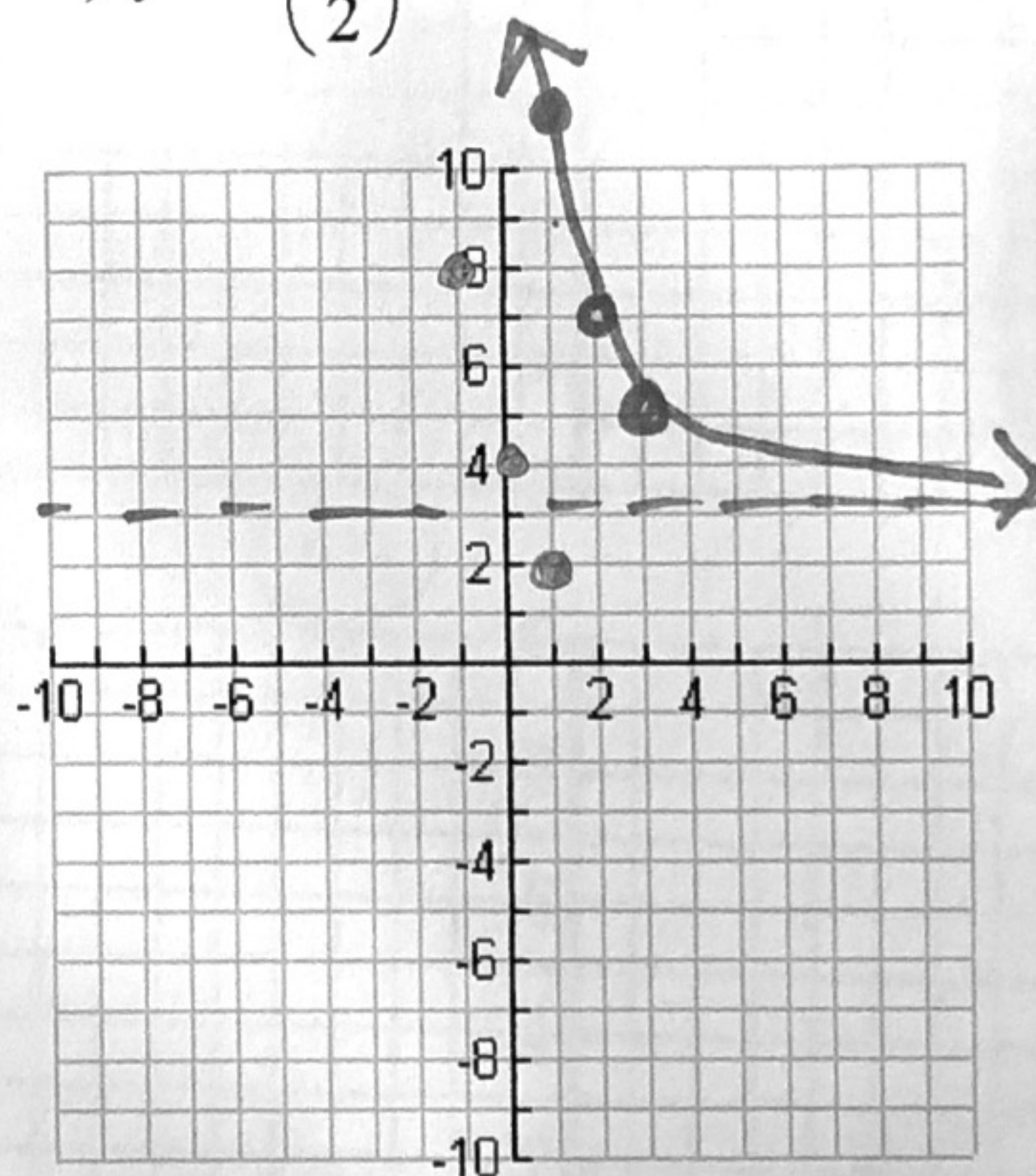
x	y
-1	$2 \cdot \frac{1}{3} = \frac{2}{3}$
0	$2 \cdot 1 = 2$
1	$2 \cdot 3 = 6$

Shift pts
→ 1
↑ 2



Asymptote: $y = 2$ "k"
Domain: $\mathbb{R}$
Range: $y > 2$

6.) $y = 4\left(\frac{1}{2}\right)^{x-2} + 3$



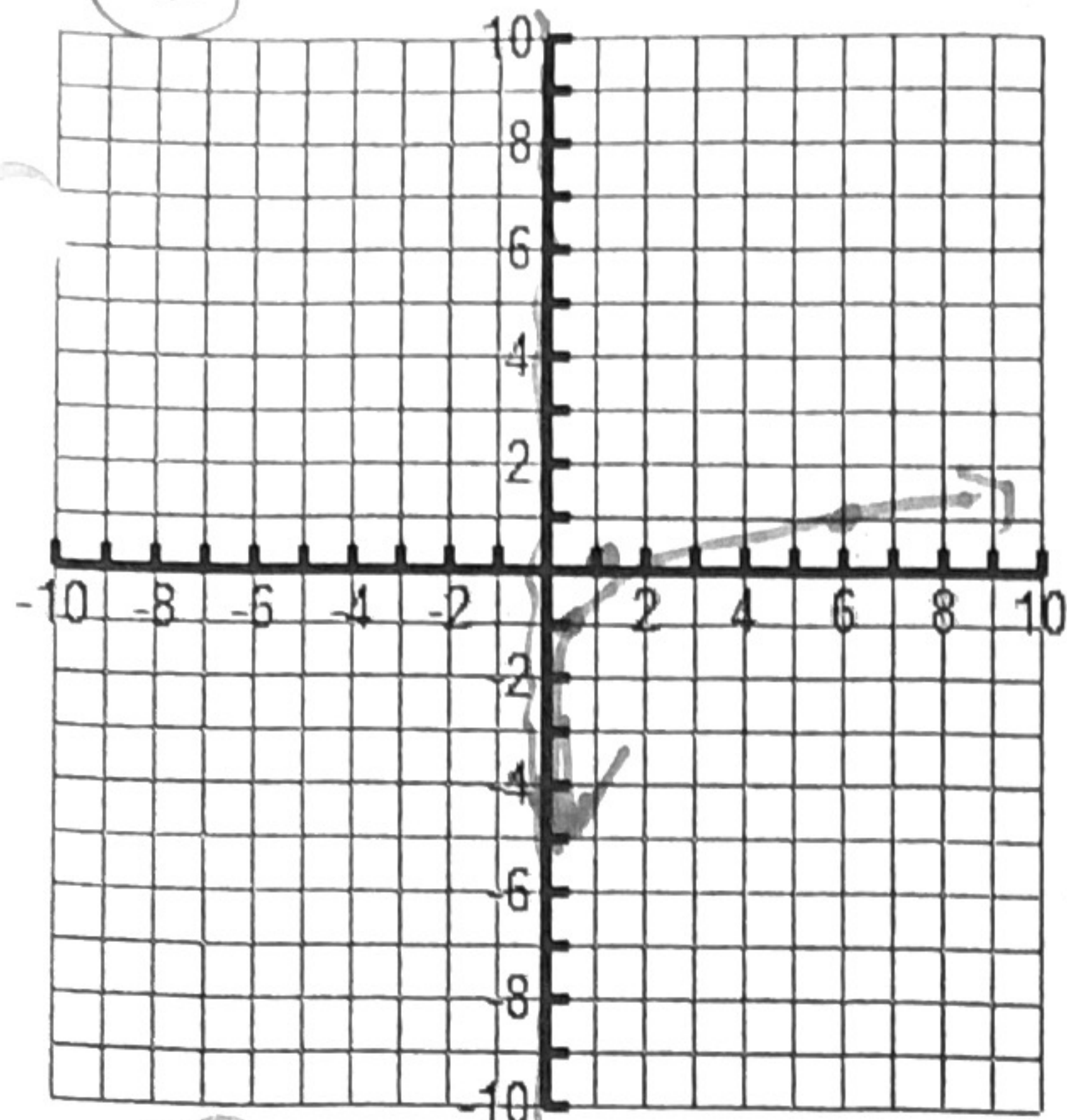
$y = 4 \cdot \frac{1}{2}$

x	y
-1	$4 \cdot 2 = 8$
0	$4 \cdot 1 = 4$
1	$4 \cdot \frac{1}{2} = 2$

Shift pts
→ 2
↑ 3

Asymptote: $y = 3$ "k"
Domain: $\mathbb{R}$
Range: $y > 3$

46



$$y = \log_6 x$$

$$6^y = x$$

x	y
$\frac{1}{6}$	-1
1	0
6	1

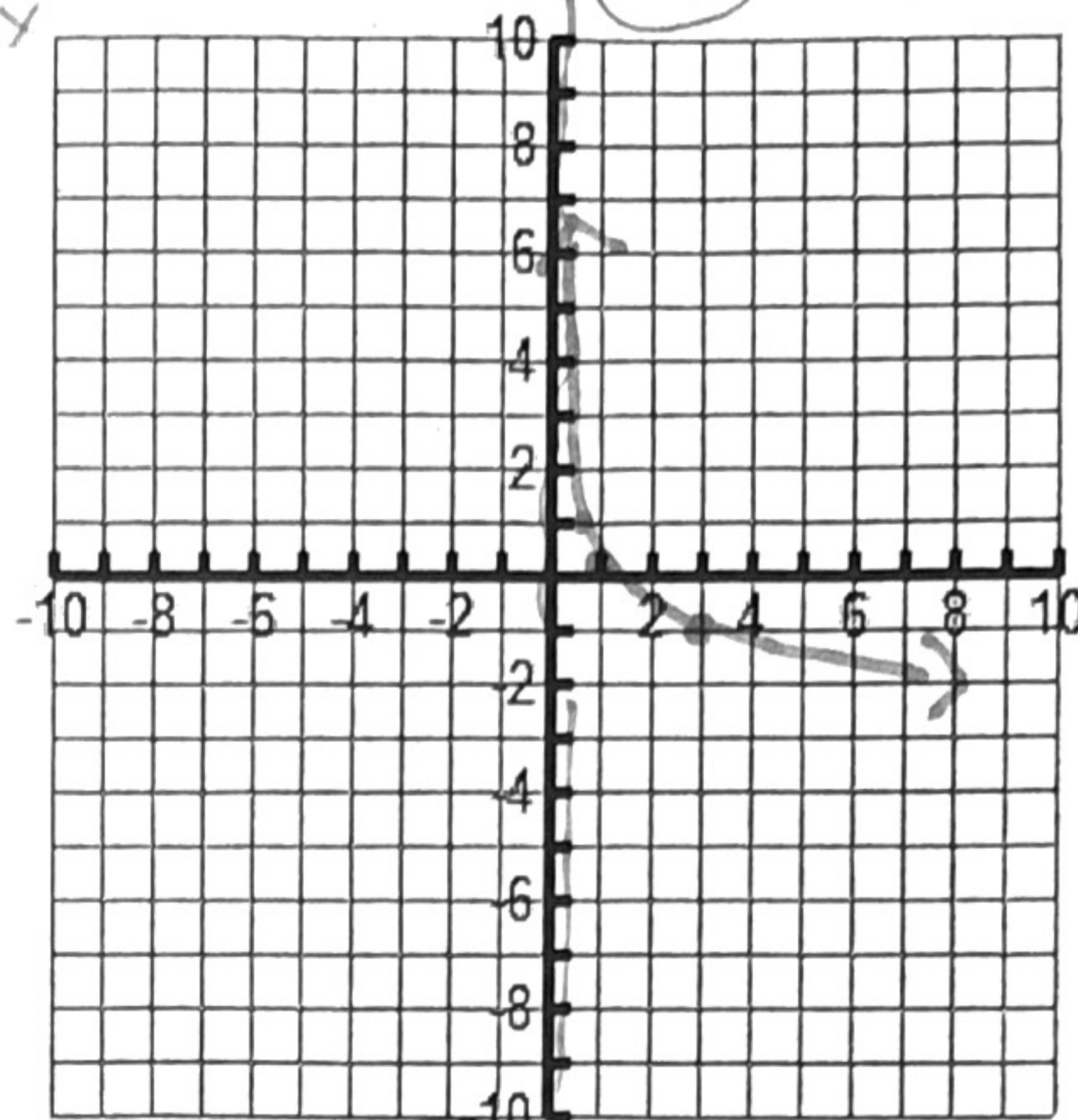
V.A

$$x = 0$$

$$D: x > 0$$

$$R: \mathbb{R}$$

47



$$y = \log_{\frac{1}{3}} x$$

$$\frac{1}{3}^y = x$$

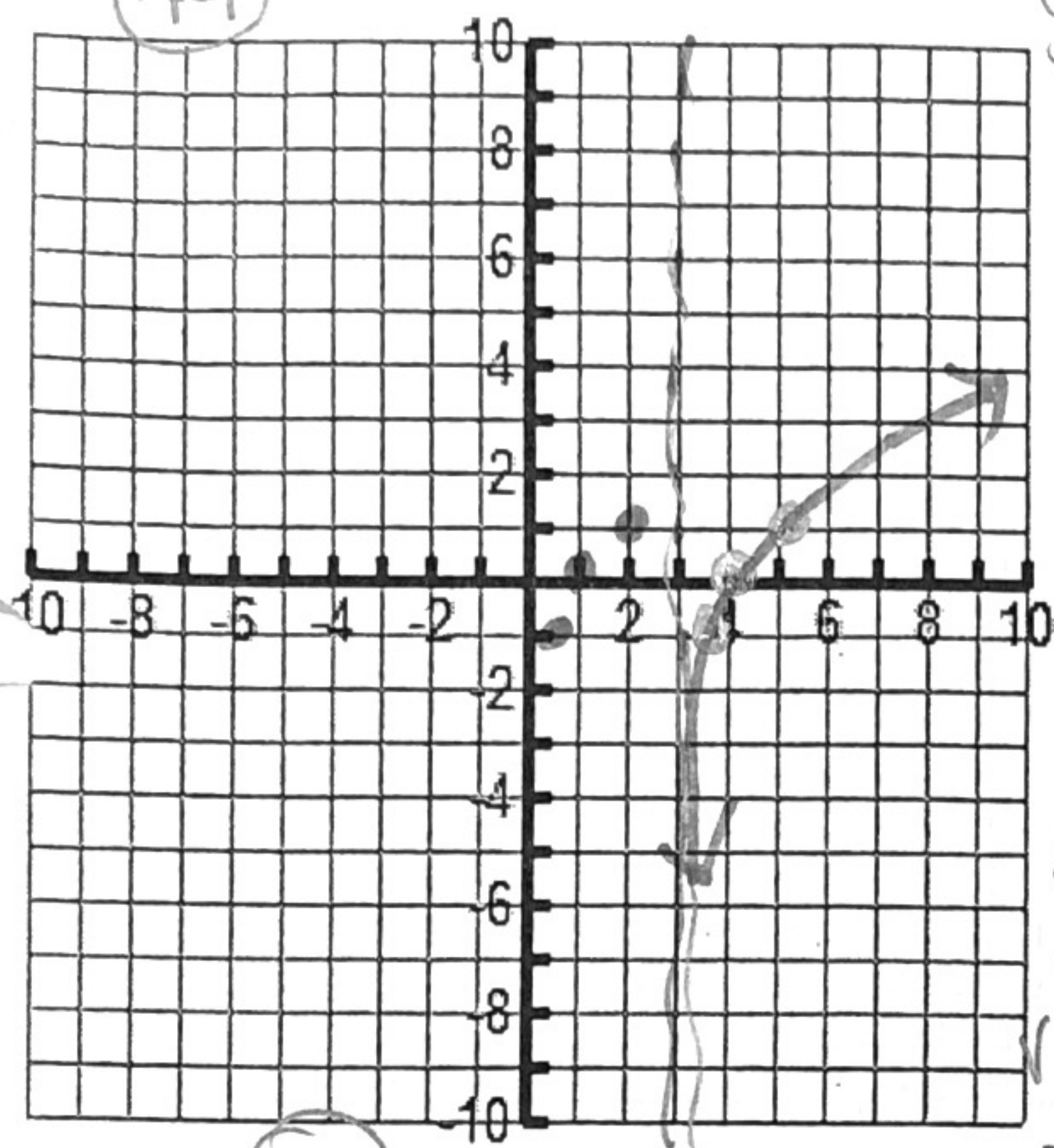
x	y
$\frac{1}{3}$	-1
1	0
$\frac{1}{3}$	1

VA $x = 0$

$$D: x > 0$$

$$R: \mathbb{R}$$

49



$$y = \log_2(x-3)$$

$$2^y = x$$

x	y
$\frac{1}{2}$	-1
1	0
2	1

Shift + pt

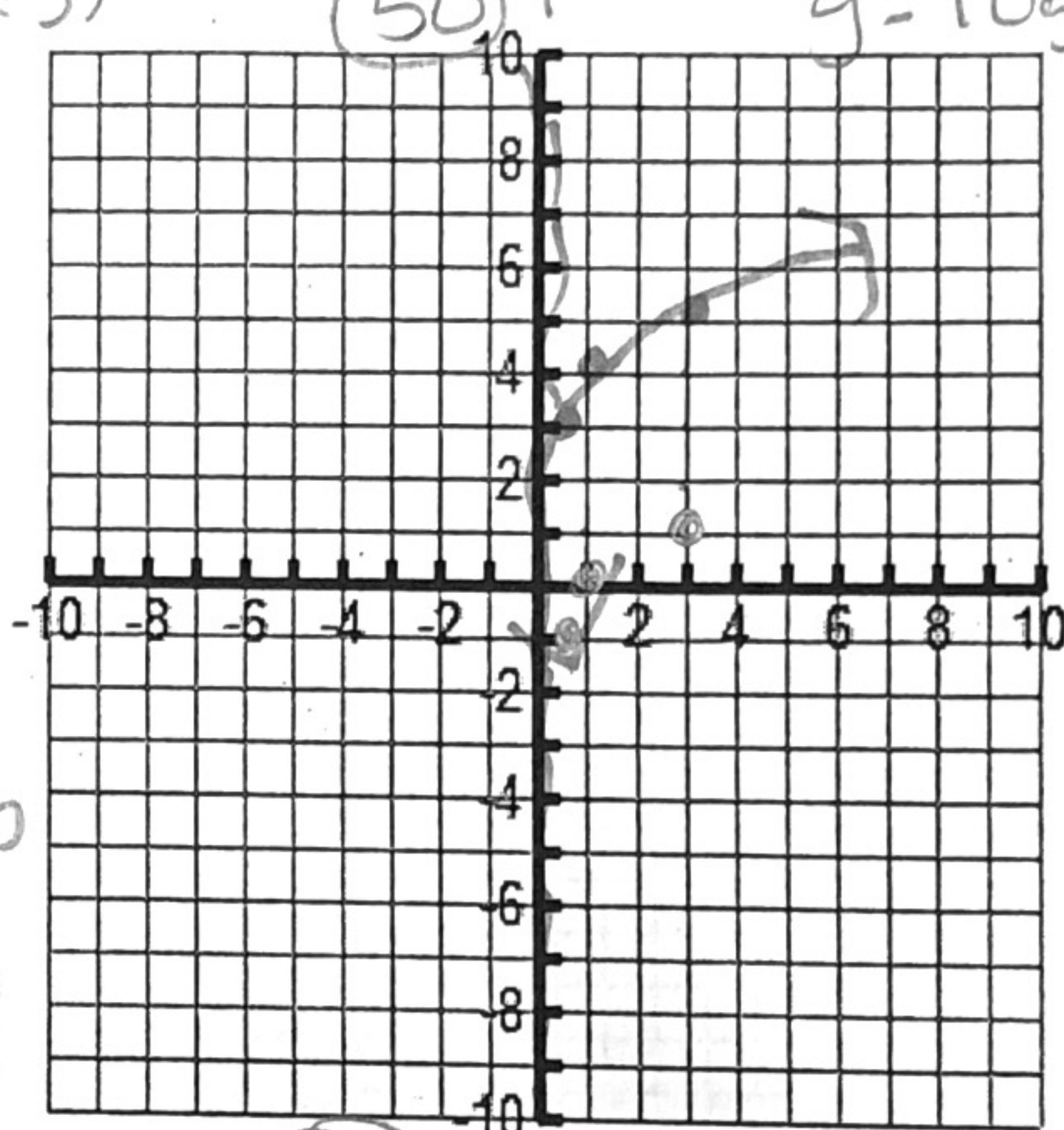
$\rightarrow 3$

VA $x = 3$

$$D: x > 3$$

$$R: \mathbb{R}$$

50



$$y = \log_3 x + 4$$

$$3^y = x$$

x	y
$\frac{1}{3}$	-1
1	0
3	1

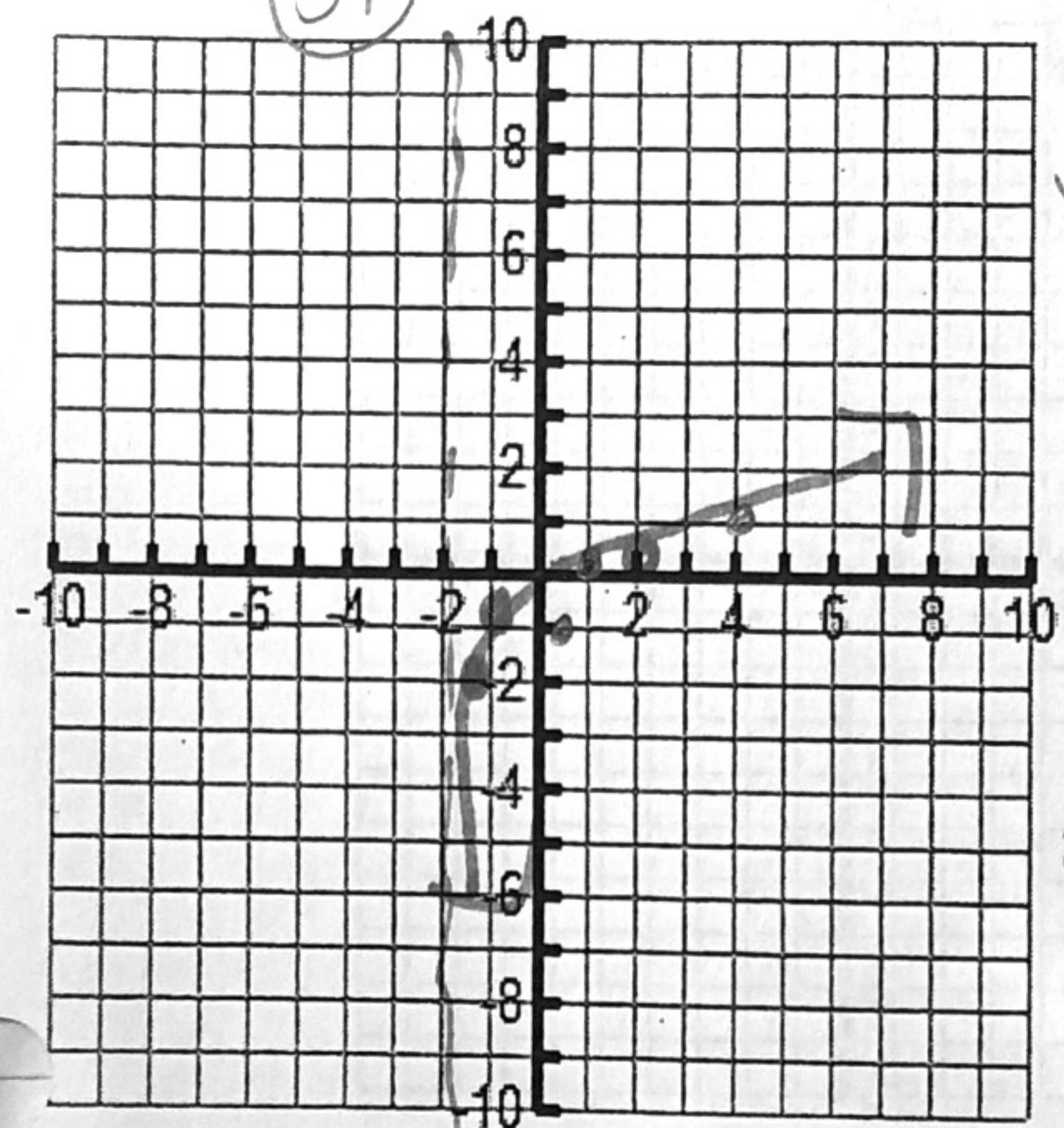
Shift + pt
 $\uparrow 4$

VA $x = 0$

$$D: x > 0$$

$$R: \mathbb{R}$$

51



$$y = \log_4(x+2) - 1$$

$$4^y = x$$

x	y
$\frac{1}{4}$	-1
1	0
4	1

Shift + pt

$\leftarrow 2$

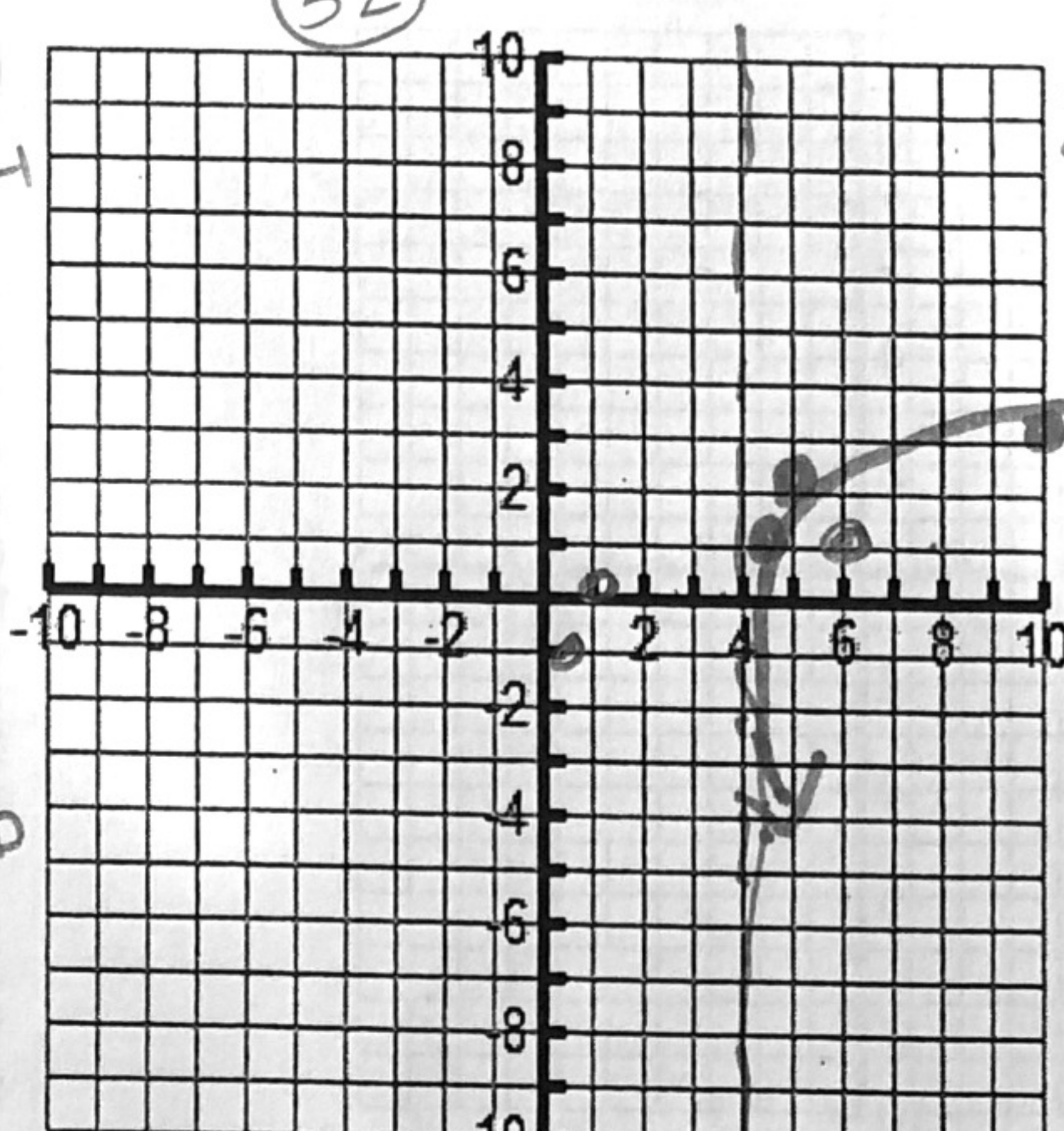
$\downarrow 1$

VA
 $x = -2$

$$D: x > -2$$

$$R: \mathbb{R}$$

52



$$y = \log_6(x-4) + 1$$

$$6^y = x$$

x	y
$\frac{1}{6}$	-1
1	0
6	1

Shift + pt

$\rightarrow 4 \uparrow 1$

VA $x = 4$

$$D: x > 4$$

$$R: \mathbb{R}$$

Alg 2T

DL Chp 7 p 510 15-42 mult 3, 54-56

$$(15) \log_3 4 + \log_3 x$$

$$(18) 5 \log_5 x$$

$$(21) \log_4 x - (\log_4 3 + \log_4 y)$$

$$(24) \log_6 36 + 2 \log_6 x$$

$$(27) \frac{1}{2} \log_2 x \rightarrow \text{remember } \sqrt{x} = x^{\frac{1}{2}}$$

$$(30) \frac{1}{2} (\log_3 9 + \log_3 x)$$

$$(33) \log_4 \frac{7}{10}$$

$$(54) \frac{\log 48}{\log 4} = \boxed{2.792}$$

$$(36) \ln x^8 y^4$$

$$(55) \frac{\log 27}{\log 9} = \boxed{1.5}$$

$$(39) \ln 40 \left(\frac{1}{2}\right)^2 x$$

$$\ln 40 \cdot \frac{1}{4} \cdot x$$

$$\boxed{\ln 10x}$$

$$(56) \frac{\log 32}{\log 8} = \boxed{1.667}$$

$$(42) \log_3 \left(\frac{20}{4}\right)^2 \cdot 4^{\frac{1}{2}}$$

$$\log_3 5^2 \cdot 2$$

$$\log_3 25 \cdot 2 = \boxed{\log_3 50}$$