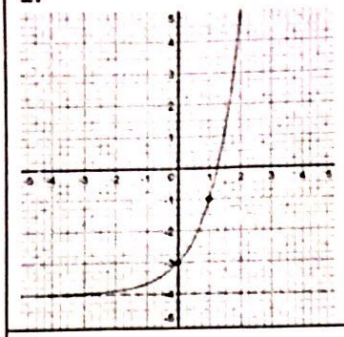
Given the graph, state the domain, range, and asymptote. Then, write the equation of the graph.

1.



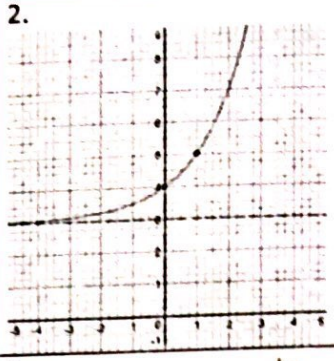
D: $(-\infty, +\infty)$

R: $(-4, +\infty)$

A: $y = -4$

Eqn: $f(x) = 3^x - 4$

2.



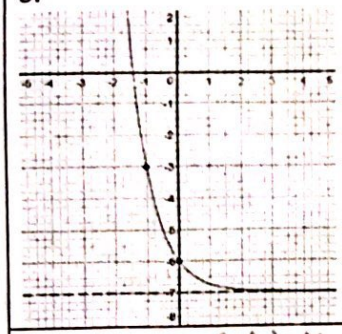
D: $(-\infty, +\infty)$

R: $(3, +\infty)$

A: $y = 3$

Eqn: $f(x) = 2^x + 3$

3.



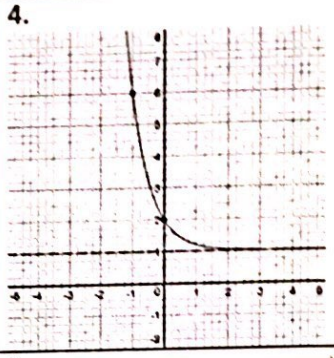
D: $(-\infty, +\infty)$

R: $(-7, +\infty)$

A: $y = -7$

Eqn: $f(x) = \left(\frac{1}{4}\right)^x - 7$

4.



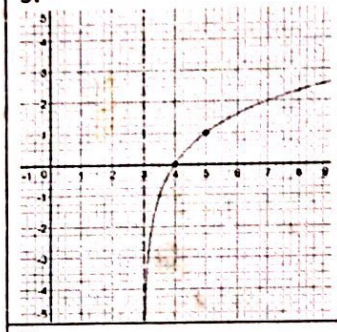
D: $(-\infty, +\infty)$

R: $(1, +\infty)$

A: $y = 1$

Eqn: $f(x) = \left(\frac{1}{5}\right)^x + 1$

5.



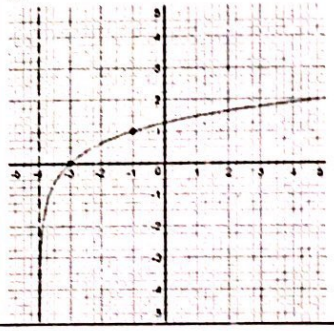
D: $(3, +\infty)$

R: $(-\infty, +\infty)$

A: $x = 3$

Eqn: $f(x) = \log_2(x-3)$

6.



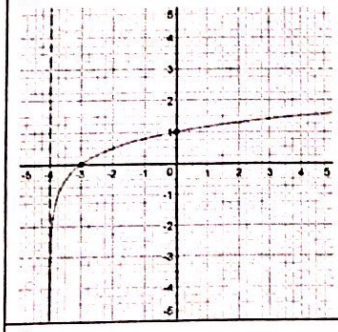
D: $(-4, +\infty)$

R: $(-\infty, +\infty)$

A: $x = -4$

Eqn: $f(x) = \log_3(x+4)$

7.



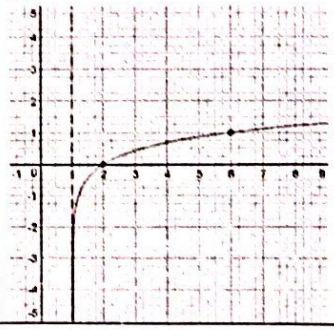
D: $(-4, +\infty)$

R: $(-\infty, +\infty)$

A: $x = -4$

Eqn: $f(x) = \log_4(x+4)$

8.



D: $(1, +\infty)$

R: $(-\infty, +\infty)$

A: $x = 1$

Eqn: $f(x) = \log_5(x-1)$

1) $(0,-3)\ (1,-1)$ $y=-4$ $f(x)=3^x-4$

$y=ab^x+c$

$-3=ab^0-4$ $-1=(1)b^1-4$

$-3=a-4$ $3=b$

$1=a$

2) $(0,4)\ (1,5)$ $y=3$ $f(x)=2^x+3$

$4=ab^0+3$ $5=(1)b^1+3$

$1=a$ $2=b$

3) $(0,-6)\ (-1,-3)$ $y=-7$ $f(x)=\left(\frac{1}{4}\right)^x-7$

$-6=ab^0-7$ $-3=(1)b^{-1}-7$

$1=a$ $4=b^{-1}$

$b=\frac{1}{4}$

4) $(0,2)\ (-1,6)$ $y=1$ $f(x)=\left(\frac{1}{5}\right)^x+1$

$2=ab^0+1$ $6=(1)b^{-1}+1$

$1=a$ $5=b^{-1}$

$b=\frac{1}{5}$

5) $y = \log_b(x-c) + d$ ← vertical shift

↑ asymptote

(4,0) (5,1) $x = 3$

$1 = \log_b(5-3)$

$1 = \log_b 2$

$b = 2$

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

6) (-3,0) (-1,1) $x = -4$

$1 = \log_b(-1-(-4))$

$1 = \log_b(3)$

$b = 3$

$f(x) = \log_3(x+4)$

7) (-3,0) (0,1) $x = -4$

$1 = \log_b(0-(-4))$

$1 = \log_b(4)$

$b = 4$

$f(x) = \log_4(x+4)$

8) (2,0) (6,1) $x = 1$

$1 = \log_b(6-1)$

$1 = \log_b 5$

$b = 5$

$f(x) = \log_5(x-1)$