9.6 Exponential & Log Graphs

(19) $f(x)=5^x$ $\boxed{III}$
$(0,1)$ $(1,5)$ $y=0$

(20) $f(x)=-5^x$ reflection over x-axis
$(0,-1)$ $(1,-5)$ $y=0$ $\boxed{V}$

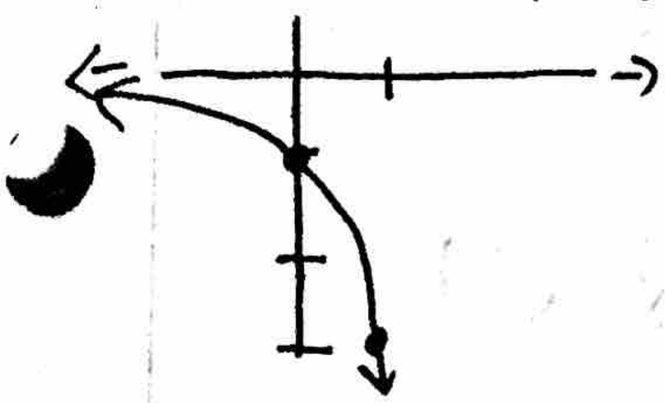
(21) $f(x)=5^{-x}$ ref. over y
$(0,1)$ $(-1,5)$ $y=0$ $\boxed{I}$

(22) $f(x)=5^x+3$ VS ↑ 3
$(0,4)$ $(1,8)$ $y=3$ $\boxed{VI}$

(23) $f(x)=5^{x-3}$ HS → 3
$(3,1)$ $(4,5)$ $y=0$ $\boxed{II}$

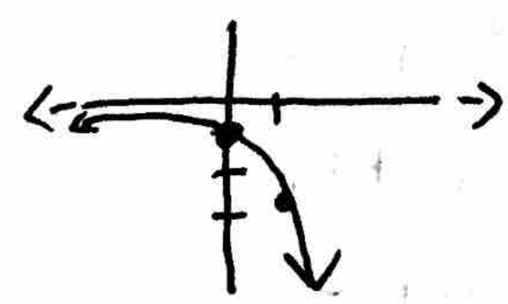
(24) $f(x)=5^{x+1}-4$ VS ↓ 4 HS ← 1
$(-1,-3)$ $(0,-4)$ $y=-4$ $\boxed{IV}$

(25) $f(x)=-3^x$ reflection over x-axis $-y$
$(0,-1)$ $(1,-3)$ $y=0$



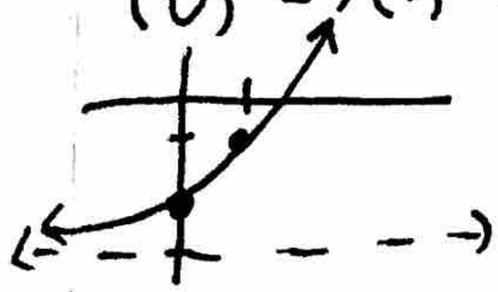
Asymptote: $y=0$
(HA)
Domain: $(-\infty,\infty)$
Range: $(0,-\infty)$

(33) $f(x)=-e^x$
reflect over x-axis
base e (2.71...)
$(0,-1)$ $(1,-2.71)$ $y=0$



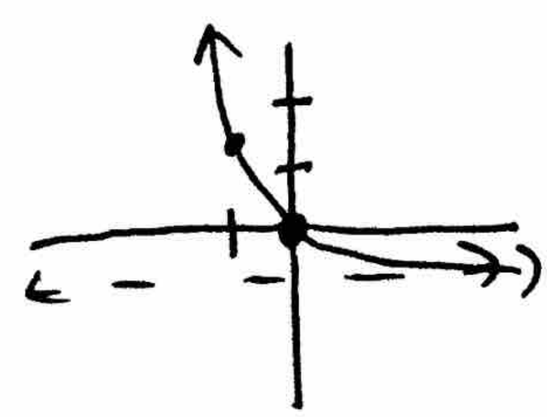
HA: $y=0$
D: $(-\infty,\infty)$
R: $(-\infty,0)$

(27) $g(x)=2^x-3$ VS ↓ 3
$(0,-2)$ $(1,-1)$ $y=-3$



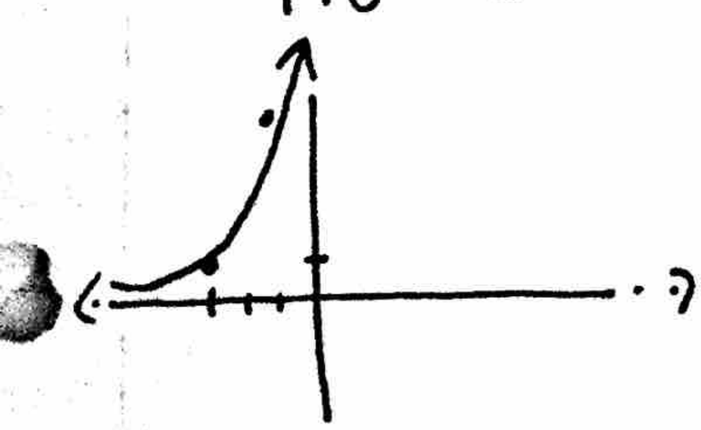
HA: $y=-3$
Domain: $(-\infty,\infty)$
Range: $(-3,\infty)$

(35) $y=e^{-x}-1$
VS ↓ 1 reflect over y-axis $-x$
$(0,0)$ $(-1,1.71)$ $y=-1$



HA: $y=-1$
D: $(-\infty,\infty)$
R: $(-1,\infty)$

(31) $f(x)=10^{x+3}$
HS ← 3



PF: $(0,1)$ $(1,10)$ $y=0$
NF: $(-3,1)$ $(-2,10)$ $y=0$

HA: $y=0$
Domain: $(-\infty,\infty)$
Range: $(0,\infty)$

parent function $y=\ln x$ $(1,0)$ $(2.71,1)$ $x=0$

(41) $f(x)=-\ln x$ ref. over y-axis
$(1,0)$ $(-2.71,1)$ $x=0$ $\boxed{IV}$

(42) $f(x)=\ln(x-2)$ HS $\rightarrow 2$
$(3,0)$ $(4.71,1)$ $x=2$ $\boxed{V}$

(43) $f(x)=2+\ln x$ VS $\uparrow 2$
$(1,2)$ $(2.71,3)$ $x=0$ $\boxed{III}$

(44) $f(x)=\ln(-x)$ ref. over x-axis
$(1,0)$ $(2.71,-1)$ $x=0$ $\boxed{II}$

(45) $f(x)=\ln(2-x) \Rightarrow \ln(-(x-2))$
ref. over x/HS $\rightarrow 2$
$(1,0)$ $(-.71,1)$ $x=2$ $\boxed{VI}$

(46) $f(x)=-\ln(-x)$
ref. over x & y-axis $\boxed{I}$
$(-1,0)$ $(-2.71,-1)$ $x=0$

(59) $f(x)=\log_{10}(x+3)$

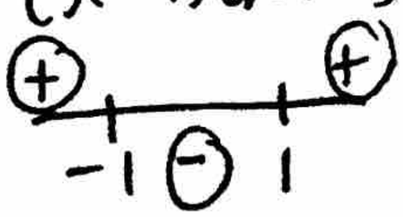
$x+3>0$
$x>-3$ $\boxed{(-3,\infty)}$

(60) $f(x)=\log_5(8-2x)$

$8-2x>0$
$-2x>-8$
$x<4$ $\boxed{(-\infty,4)}$

(61) $g(x)=\log_3(x^2-1)$

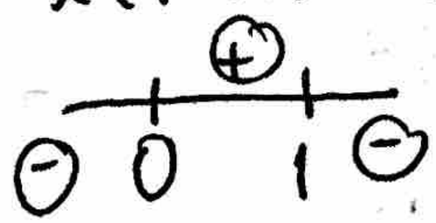
$x^2-1>0$ pos.
$(x-1)(x+1)>0$



$\boxed{(-\infty,-1)\cup(1,\infty)}$

(62) $g(x)=\ln(x-x^2)$

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



$\boxed{(0,1)}$