

1.6 Transformations of Functions

For each Function, **WITHOUT** a calculator:

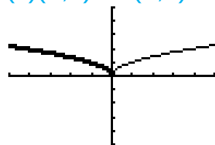
- Identify the domain using interval notation.
- Describe the transformations in words.
- Sketch a graph of the function to show the transformations – BY HAND and remember to show how your critical points and any asymptotes are transformed.
- Identify the range using interval notation.

1) $f(x) = \sqrt{-x}$

(a) Domain: $(-\infty, 0]$

(b) Reflect over y-axis

(c) $(0,0) \rightarrow (0,0)$



(d) Range $[0, \infty)$

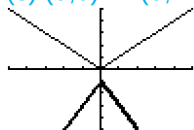
2) $g(x) = -2|x| - 1$

(a) Domain: $(-\infty, \infty)$

(b) Reflect over x-axis, Vertical stretch by 2

Down 1

(c) $(0,0) \rightarrow (0,-1)$



(d) Range $(-\infty, -1]$

3) $h(x) = \frac{1}{x-4}$

(a) Domain: $(-\infty, 4) \cup (4, \infty)$

(b) Move right four

(c) Vertical asymptote $x=0 \rightarrow x=4$



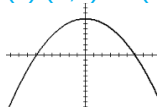
(d) Range $(-\infty, 0) \cup (0, \infty)$

4) $f(x) = -\frac{1}{5}x^2 + 7$

(a) Domain: $(-\infty, \infty)$

(b) Reflect over x-axis, vertical compression by 1/5, Up 7

(c) $(0,0) \rightarrow (0,7)$



(d) Range $(-\infty, 7]$

5) $g(x) = e^{x+3} - 2$

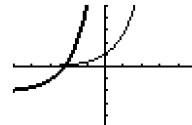
(a) Domain: $(-\infty, \infty)$

(b) Left 3

Down 2

(c) $(0,1) \rightarrow (-3,-1)$

Horizontal asymptote $y=0 \rightarrow y=-2$



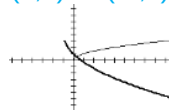
(d) Range $(-2, \infty)$

6) $h(x) = -3\sqrt{x+1} + 4$

(a) Domain: $[-1, \infty)$

(b) Reflect over x-axis, vertical stretch by 3, up 4

(c) $(0,0) \rightarrow (-1,4)$



(d) Range $(-\infty, 4]$

7) $f(x) = \ln(x-3) + 2$

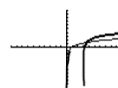
(a) Domain: $(3, \infty)$

(b) Right 3

Up 2

(c) $(1,0) \rightarrow (4,2)$

Vertical asymptote $x=0 \rightarrow x=4$



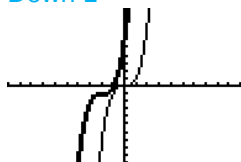
(d) Range $(-\infty, \infty)$

8) $g(x) = (x+2)^3 - 1$

a) Domain $(-\infty, \infty)$

b) Left 2

Down 1



c)

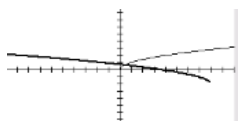
$(0,0) \rightarrow (-2,-1)$

d) $(-\infty, \infty)$

9) $h(x) = \sqrt{8-x} - 2$

a) Domain $(-\infty, 8]$

b) Reflect over y-axis, right 8, down 2



c)

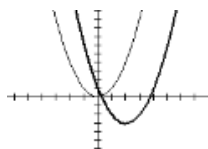
$(0,0) \rightarrow (8,-2)$

d) $[-2, \infty)$

10) $f(x) = (x-2)^2 - 3$

a) Domain $[-3, \infty)$

b) Right 2, down 3



c)

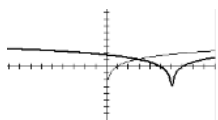
$(0,0) \rightarrow (2,-3)$

d) $[-3, \infty)$

11) $g(x) = \ln(|x-6|)$

a) Domain $(-\infty, 6) \cup (6, \infty)$

b) Right 6 AND reflect over y-axis and right 6



c)

$(1,0) \rightarrow (7,0)$ AND $(1,0) \rightarrow (5,0)$

VA $x=0 \rightarrow x=6$

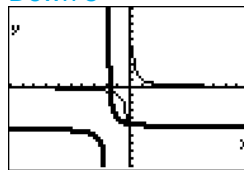
d) $(-\infty, \infty)$

12) $h(x) = \frac{1}{x+2} - 5$

a) Domain $(-\infty, -2) \cup (-2, \infty)$

b) Left 2

Down 5



c)

HA: $y=0 \rightarrow y=-5$

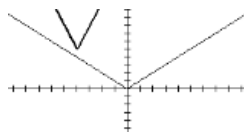
VA: $x=0 \rightarrow x=-2$

d) Range $(-\infty, -5) \cup (-5, \infty)$

13) $f(x) = 3|x+4| + 5$

a) Domain $(-\infty, \infty)$

b) Vertical stretch by 3, left 4, up 5



c)

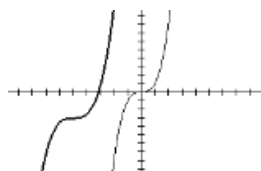
$(0,0) \rightarrow (-4,5)$

d) $[5, \infty)$

14) $g(x) = \frac{1}{2}(x+5)^3 - 3$

a) Domain $(-\infty, \infty)$

b) Vertical compression by 1/2, left 5, down 3



c)

$(0,0) \rightarrow (-5,-3)$

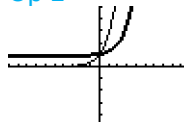
d) $(-\infty, \infty)$

15) $h(x) = e^{x-2} + 1$

a) Domain $(-\infty, \infty)$

b) Right 2

Up 1



c)

$(0,1) \rightarrow (2,2)$

HA: $y=0 \rightarrow y=1$

d) Range $(1, \infty)$