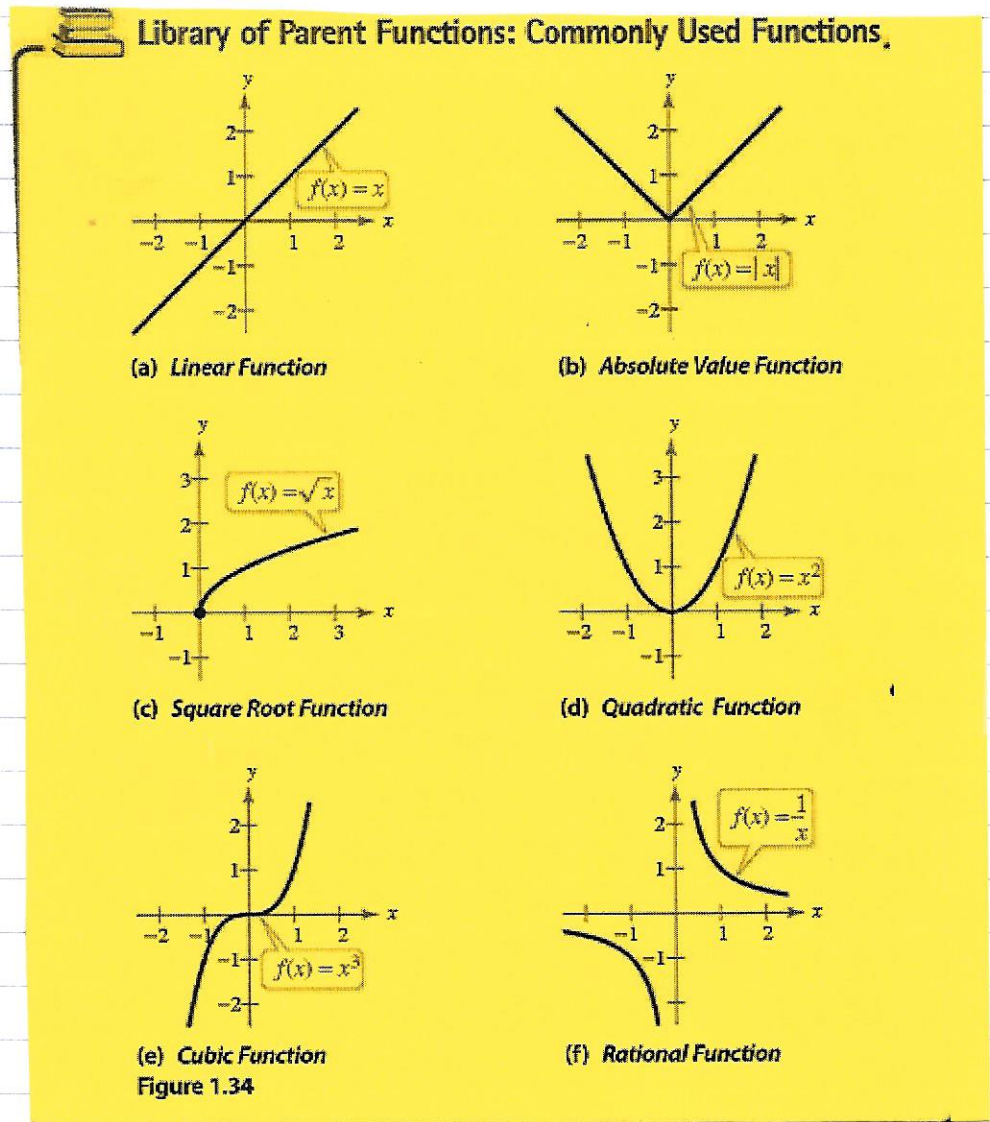


1.4 Transformations

Parent functions



Reflection

$y = -f(x)$ reflection across the x-axis

$y = f(-x)$ reflection across the y-axis

Vertical Shifts

$y = f(x) + k$

graph moves up k units

$y = f(x) - k$

graph moves down k units

* Horizontal

$y = f(x-h)$ translate h units right \rightarrow

$y = f(x+h)$ translate h units left \leftarrow

Vertical

$y = af(x)$ stretch if $a > 1$

Stretch /
Compression

Compression if $0 < a < 1$

Outside # changes the y -value.
inside # changes the x -value

* Horizontal
Stretch /
compression

$y = f(ax)$ stretch if $a > 1$

Compression if $0 < a < 1$

* Multiply x -value by reciprocal of a

Ex. 1

a)

Describe the translations from parent function

$$g(x) = -x + 3$$



① reflection
across the x -axis

② Vertical shift
3 units up

b)

$$g(x) = 2 \left[\frac{1}{3} x \right] + 5$$



① Vertical
stretch by
a factor of
2.

② Horizontal
stretch by factor of
3

③ Shift up 5

Ex. 2

Describe the transformations from the parent function

$$g(x) = 3 + 2(x-4)^2$$

①

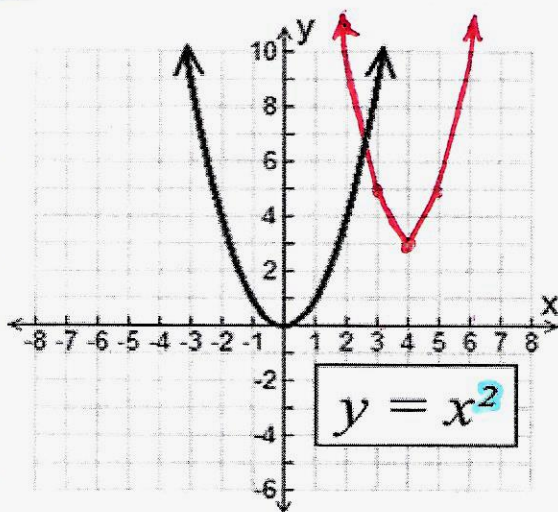
②

③

① Vertical 3 units up

② Vertical stretch of 2

③ horizontal 4 units to the left.



CW: p. 47 5, 9, 11, 29-34 all

20 problems

51-63 odd 66-68 all