

Apply

5. For each transformation, identify the values of h and k . Then, write the equation of the transformed function in the form $y - k = f(x - h)$.

a) $f(x) = \frac{1}{x}$, translated 5 units to the left and 4 units up

b) $f(x) = x^2$, translated 8 units to the right and 6 units up

c) $f(x) = |x|$, translated 10 units to the right and 8 units down

d) $y = f(x)$, translated 7 units to the left and 12 units down

(a) $f(x) = \frac{1}{x}$

I) 5 units to left } order does not matter in this case
 II) 4 " up }
 $f(\dots) + 4$

horizontal \Rightarrow in bracket
 horizontal & left $\Rightarrow \oplus$ sign $f(x+5)$

the transformation is then $y = f(x+5) + 4$
 modify to fit the given template

$y - k = f(x - h)$

and we get

$y - 4 = f(x - (-5))$
 \downarrow \downarrow
 $k = 4$ $h = -5$

Notice that it really does not matter what the definition of $f(x)$ was a.k.a $f(x) = \frac{1}{x}$
 the transformation tells us what it does to the parent function, not caring what that parent actually is.

b) $f(x) = x^2$

$\rightarrow g(x) \rightarrow$ translate 8 to the Right
 $g(x) = f(x-8)$

\rightarrow - " - 6 units up

$g(x) = f(x-8) + 6$ | -6
 $\underbrace{\hspace{1cm}}_y$ \leftarrow

the result is

$y - 6 = f(x - 8)$

c) $f(x) = |x|$

$\rightarrow g(x) \rightarrow$ translate 10 to the R

$g(x) = f(x - 10)$

$$g(x) = f(x-10)$$

→ translate 8 down

$$g(x) = f(x-10) - 8 \quad | +8$$

$\underbrace{\hspace{10em}}_y$ ↖

the result is: $y+8 = f(x-10)$

d) $f(x)$

$g(x)$ → translated 7 to the L

$$g(x) = f(x+7)$$

→ translated 12 down

$$g(x) = f(x+7) - 12 \quad | +$$

$\underbrace{\hspace{10em}}_y$ ↖

the result is: $y+12 = f(x+7)$

[eofile]