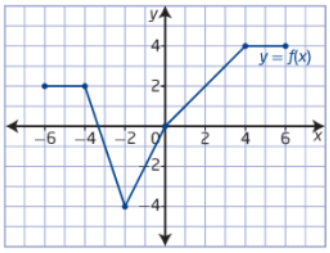
p 028, q6

**6.** The graph of the function $y = f(x)$ is vertically stretched about the $x$-axis by a factor of 2.




**a)** Determine the domain and range of the transformed function.

**b)** Explain the effect that a vertical stretch has on the domain and range of a function.

this is a vertical stretch

$f(x)$ = shown

$g(x) = 2 \cdot f(x)$

a) Domain of $f(x)$ based on what we see on the graph is

$D_f = \{x, x \in [-6, 6], x \in \mathbb{R}\}$

OR

$-6 \le x \le 6$

the range:

$R_f = \{y, y \in [-4, 4], y \in \mathbb{R}\}$

OR

$-4 \le y \le 4$

Now we can construct $D_g$ and $R_g$ based on $D_f$ and $R_f$.

The only transformation that happens to g is vertical, this means there are no horizontal, a.k.a. x-axis and x coordinate changes. Thus the domain must remain the same:

$D_g = D_f = \{x \mid x \in [-6, 6], x \in \mathbb{R}\}$

} (b) this explains the effect of the vertical stretch on the Domain, i.e no effect

The range is stretched by a factor of 2 b/c we applied the vertical stretch. To find $R_g$ we stretch the edges of $R_f$:

} (b) this explains the effect of the vert. stretch on the Range, i.e stretching the range by a factor of 2.

$R_f$: $-4 \le y \le 4$

$R_g$ stretched by 2: $-4 \times 2 \le y \le 4 \times 2$

i.e. $R_g = \{y \mid -8 \le y \le 8, y \in \mathbb{R}\}$

OR

$y \in [-8, 8]$.