8. Determine the product of $g(x) = \dfrac{1}{1+x}$ and $h(x) = \dfrac{1}{3+2x}$. Then, state the domain of the combined function.

$$f(x) = \frac{1}{1+x} \cdot \frac{1}{3+2x}$$

NPV $x = -1$

NPV: $x = \dfrac{-3}{2}$

$$(1+x)(3+2x) = 3 + 2x + 3x + 2x^2$$
$$= 2x^2 + 5x + 3$$

$$f(x) = \frac{1}{(1+x)(3+2x)} = \frac{1}{2x^2 + 5x + 3}$$

← the graph of the function is usefull in finding th Rauge

this is **const** **parabola** form

w/ two roots: $x = -1$ & $x = -\dfrac{3}{2} = -1.5$

The domain is the commonality of the two domains excluding the NPV-s values.

$$D_g: \{x \mid x \neq -1, x \in \mathbb{R}\}$$

$$D_h: \{x \mid x \neq -\frac{3}{2}, x \in \mathbb{R}\}$$

$$D_h : \left\{ x \mid x \neq -\frac{3}{2} , x \in \mathbb{R} \right\}$$

The common domain is
$$D_f : \left\{ x \mid x \neq -1 \ \& \ x \neq -\frac{3}{2} , x \in \mathbb{R} \right\}.$$

$$f(x) = \frac{1}{(1+x)(3+2x)} = \frac{1}{2x^2 + 5x + 3}$$