Recreate our earlier example, using these general formulas.

Suppose X_1, X_2 have density $f_X(x) = 3e^{-3x}$ for $x>0$
$= 0$ otherwise

$F_X(x) = 1-e^{-3x}$ for $x>0$
$= 0$ otherwise

and suppose X_1, X_2 are independent.

We can use the general formulas we learned to see:

$X_{(1)}, X_{(2)}$ (the first and second order statistics, respectively, i.e. $X_{(1)}$ is the $\min(X_1, X_2)$, $X_{(2)}$ is the $\max(X_1, X_2)$)

has joint density

$$f_{X_{(1)},X_{(2)}}(x_1,x_2) = 2!\,3e^{-3x_1}3e^{-3x_2} \quad \text{for } 0<x_1<x_2$$

and $X_{(1)}$ has density

$$f_{X_{(1)}}(x_1) = \underbrace{\binom{2}{0,1,1}}_{=2} 3e^{-3x_1}(1-e^{-3x_1})^0(e^{-3x_1})^1$$

$$= 6e^{-6x_1} \quad \text{for } x_1>0$$

and $X_{(2)}$ has density

$$f_{X_{(2)}}(x_2) = \underbrace{\binom{2}{1,1,0}}_{=2} 3e^{-3x_2}(1-e^{-3x_2})^1(e^{-3x_2})^0$$

$$= 6e^{-3x_2}(1-e^{-3x_2}) \quad \text{for } x_2>0$$

So the general formulas seem to work for the specific example we calculated earlier.