

DENSITY OF A SUM

Let X and Y be independent random variables and $W = X + Y$.

For continuous variables:

$$f_w(w) = \int_{-\infty}^{\infty} f_x(x) f_y(w-x) dx$$

CONVOLUTION
INTEGRAL

$$(f * g)(x) = \int_{-\infty}^{\infty} f(t) g(x-t) dt$$

For all variables:

$$M_w(t) = M_x(t) M_y(t)$$