

	0	1	2	3	4	.....	z	.....	∞
0	$p_d(y=0)$	$\left(1 - \frac{\lambda_b}{\lambda_d}\right) p_d(1)$	$\left(1 - \frac{\lambda_b}{\lambda_d}\right)^2 p_d(2)$	$\left(1 - \frac{\lambda_b}{\lambda_d}\right)^3 p_d(3)$	$\left(1 - \frac{\lambda_b}{\lambda_d}\right)^4 p_d(4)$		$\left(\frac{\lambda_b}{\lambda_d}\right)^0 \left(1 - \frac{\lambda_b}{\lambda_d}\right)^z p_d(z)$	.....
1	$\left(\frac{\lambda_b}{\lambda_d}\right) p_d(1)$	$2 \left(\frac{\lambda_b}{\lambda_d}\right) \left(1 - \frac{\lambda_b}{\lambda_d}\right) p_d(2)$	$3 \left(\frac{\lambda_b}{\lambda_d}\right) \left(1 - \frac{\lambda_b}{\lambda_d}\right)^2 p_d(3)$	$4 \left(\frac{\lambda_b}{\lambda_d}\right) \left(1 - \frac{\lambda_b}{\lambda_d}\right)^3 p_d(4)$	.....		.....	.....
2	$\left(\frac{\lambda_b}{\lambda_d}\right)^2 p_d(2)$	$3 \left(\frac{\lambda_b}{\lambda_d}\right)^2 \left(1 - \frac{\lambda_b}{\lambda_d}\right) p_d(3)$	$6 \left(\frac{\lambda_b}{\lambda_d}\right)^2 \left(1 - \frac{\lambda_b}{\lambda_d}\right)^2 p_d(4)$	.....	.....		.....	.....
3	$\left(\frac{\lambda_b}{\lambda_d}\right)^3 p_d(3)$	$4 \left(\frac{\lambda_b}{\lambda_d}\right)^3 \left(1 - \frac{\lambda_b}{\lambda_d}\right) p_d(4)$	.....	.....	.....		.....	.....
4	$\left(\frac{\lambda_b}{\lambda_d}\right)^4 p_d(4)$	.....	.....	.....	.....		.....	.....
.....
x	$\binom{x}{0} \left(\frac{\lambda_b}{\lambda_d}\right)^x * \left(1 - \frac{\lambda_b}{\lambda_d}\right)^0 p_d(x)$	$\binom{x+1}{1} \left(\frac{\lambda_b}{\lambda_d}\right)^x * \left(1 - \frac{\lambda_b}{\lambda_d}\right)^1 p_d(x+1)$	$\binom{x+2}{2} \left(\frac{\lambda_b}{\lambda_d}\right)^x * \left(1 - \frac{\lambda_b}{\lambda_d}\right)^2 p_d(x+2)$	$\binom{x+3}{3} \left(\frac{\lambda_b}{\lambda_d}\right)^x * \left(1 - \frac{\lambda_b}{\lambda_d}\right)^3 p_d(x+3)$	$\binom{x+4}{4} \left(\frac{\lambda_b}{\lambda_d}\right)^x * \left(1 - \frac{\lambda_b}{\lambda_d}\right)^4 p_d(x+4)$		$\binom{x+z}{z} \left(\frac{\lambda_b}{\lambda_d}\right)^x * \left(1 - \frac{\lambda_b}{\lambda_d}\right)^z p_d(x+z)$	.....
.....
∞

$$p_b(x) = \sum_{y=x}^{\infty} \left[\binom{y}{y-x} \left(\frac{\lambda_b}{\lambda_d}\right)^x \left(1 - \frac{\lambda_b}{\lambda_d}\right)^{y-x} p_d(y) \right] = \sum_{y=x}^{\infty} \left[\binom{y}{x} \left(\frac{\lambda_b}{\lambda_d}\right)^x \left(1 - \frac{\lambda_b}{\lambda_d}\right)^{y-x} p_d(y) \right] \quad y = x, x+1, x+2, x+3, \dots, x+z, \dots$$

$$\begin{matrix} \lambda_d \\ Y \\ P_d(y) \end{matrix}$$

depot

base

$$\begin{matrix} \lambda_b/\lambda_d \\ x \\ P_b(x) \end{matrix}$$

$$\begin{matrix} 1-(\lambda_b/\lambda_d) \\ y-x \\ P_b(z = y-x) \end{matrix}$$

base

x	$z = y - x = 0$	$\binom{y=x}{0} \left(\frac{\lambda_b}{\lambda_d}\right)^x \left(1 - \frac{\lambda_b}{\lambda_d}\right)^0 p_d(y=x)$
x	1	$\binom{x+1}{1} \left(\frac{\lambda_b}{\lambda_d}\right)^x \left(1 - \frac{\lambda_b}{\lambda_d}\right)^1 p_d(x+1)$
x	2	$\binom{x+2}{2} \left(\frac{\lambda_b}{\lambda_d}\right)^x \left(1 - \frac{\lambda_b}{\lambda_d}\right)^2 p_d(x+2)$
x	3	$\binom{x+3}{3} \left(\frac{\lambda_b}{\lambda_d}\right)^x \left(1 - \frac{\lambda_b}{\lambda_d}\right)^3 p_d(x+3)$
.....	
x	z	$\binom{x+z}{z} \left(\frac{\lambda_b}{\lambda_d}\right)^x \left(1 - \frac{\lambda_b}{\lambda_d}\right)^z p_d(x+z)$
.....	

For instance if $x=2$ and $y=5$, there are $\binom{y=5}{x=3} = \binom{5}{2}$ combination way to distribute $y=5$ spares of depot across bases with base quantity $x=2$ spares , demand rate= λ_b and $p=\lambda_b/\lambda_d$.