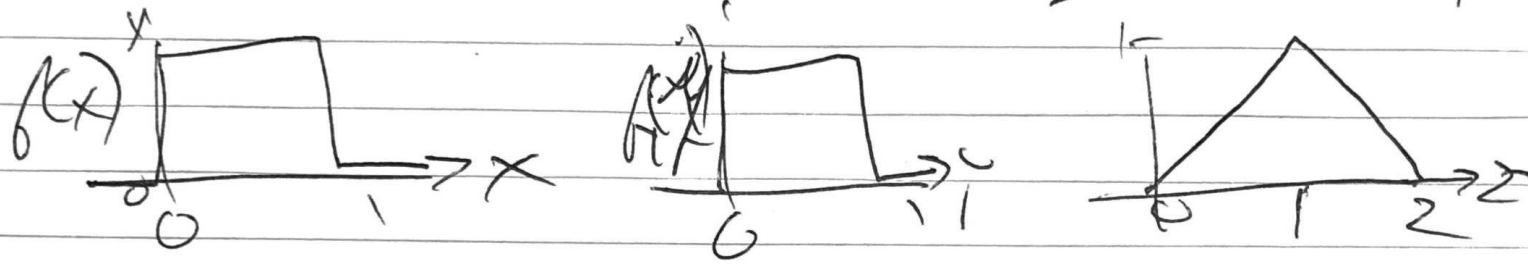
3(25/19 -1

6.5.39 SUM OF 2 R.V.

$X: U[0,1]$ $Y: U[0,1]$ $Z = X+Y$

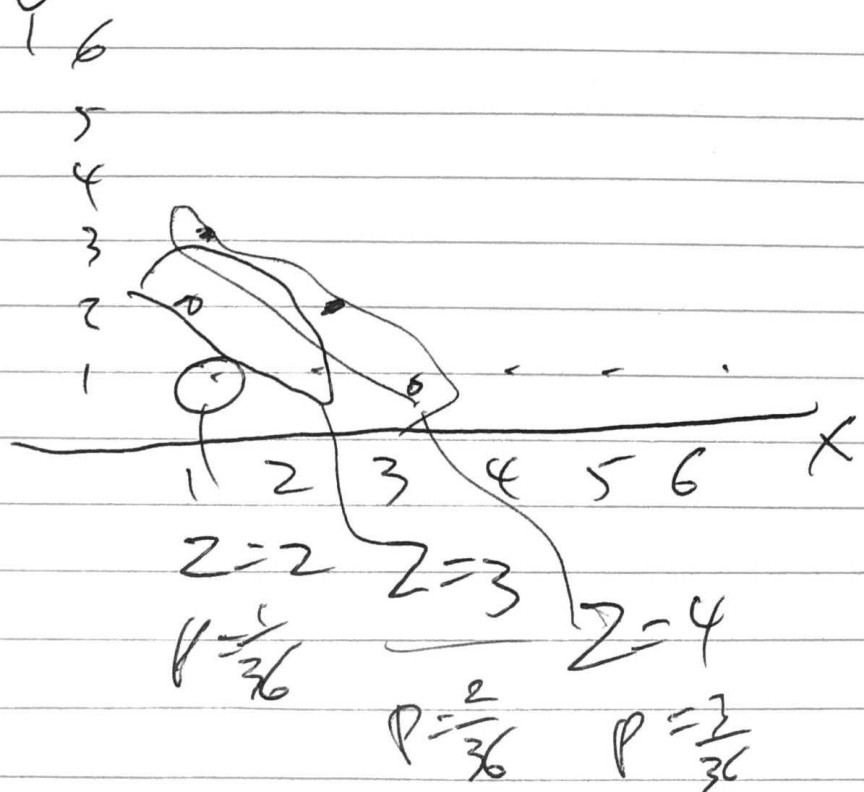


THINK 2 DICE

$X: \{1,2,3,4,5,6\}$ $p(1) = \frac{1}{6}$

$Y:$ ..... $p(1) = 1/6$

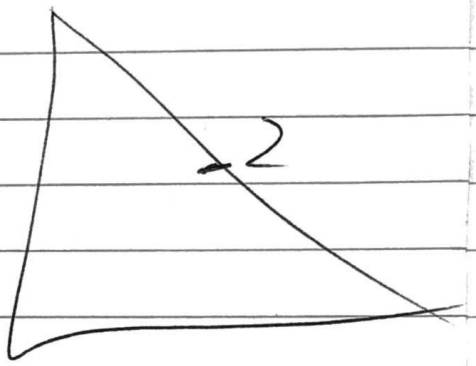
$Z = X+Y$ $P_Z(2) = \frac{1}{36}$ $P_Z(7) = \frac{6}{36}$



$$F_X(x) = \begin{cases} 0 & x < 0 \\ x & 0 < x < 1 \\ 1 & x > 1 \end{cases}$$

$$F_Y(y) = \begin{cases} 0 & y < 0 \\ y & 0 \le y \le 1 \\ 1 & y > 1 \end{cases}$$

$Z = X + Y$



$$F_Z(z) = P[X + Y \le z]$$

$$\int_x P_X[x]\, P_Y[z - x]$$

$$f_Z(z) = \int_{-\infty}^{\infty} f_X(x)\, f_Y(z - x)\, dx$$

$$= \int f_Y(z - x)\, dx$$

0 UNLESS $x < z$

AND $z - x < 1$

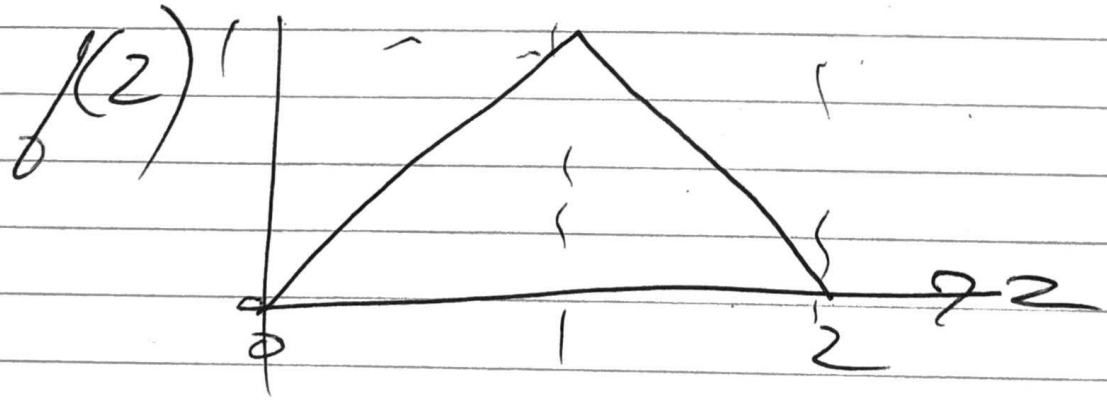
$0 \le z - x \le 1$

2 CASES: $z < 1$, $z > 1$

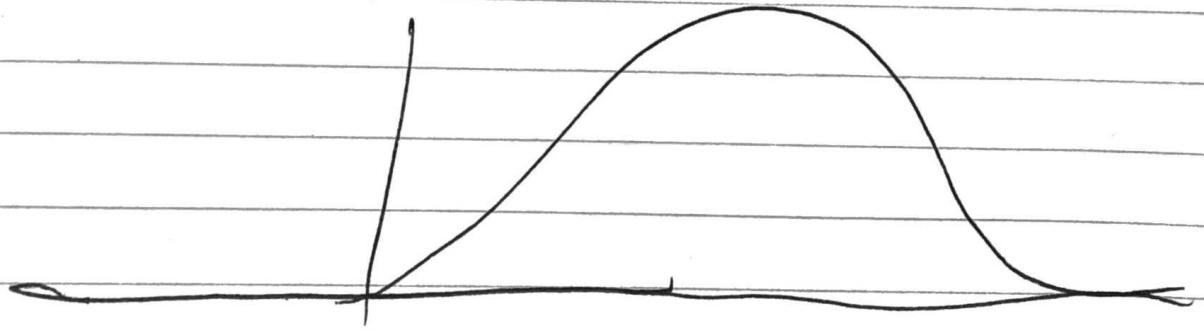
$z<1 \quad f(z) = \int_0^z dx = z$

$z>1 \quad f(z) = \int_{z-1}^1 dx = 2-z$

$$f_Z(z) = \begin{cases} 0 & \text{if } z<0 \\ z & 0<z<1 \\ 2-z & \text{if } 1<z<2 \\ 0 & z>2 \end{cases}$$



SUM OF 10 UNIFORM R.V.



QUITE CLOSE TO NORMAL.