

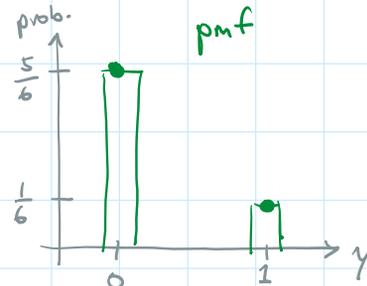
**Warm-Up:** Two standard, fair dice are rolled. Define random variable  $Y$  as follows:

$$Y = \begin{cases} 1 & \text{if the sum of the dice is 7,} \\ 0 & \text{otherwise.} \end{cases}$$

Probability Mass Function (pmf)

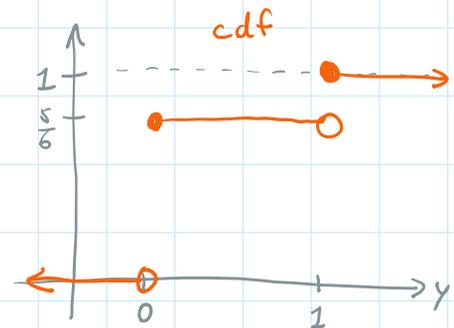
$$p(0) = P(Y=0) = \frac{5}{6}$$

$$p(1) = P(Y=1) = \frac{1}{6}$$



Cumulative Distribution Function (cdf)

$$F(y) = P(Y \leq y) = \begin{cases} 0 & \text{if } y < 0 \\ \frac{5}{6} & \text{if } 0 \leq y < 1 \\ 1 & \text{if } 1 \leq y \end{cases}$$



Now define random variable  $X$  to be the sum of the numbers on the two dice.

Value $x$	2	3	4	5	6	7	8	9	10	11	12
pmf $p(x)$	$\frac{1}{36}$	$\frac{2}{36}$	$\frac{3}{36}$	$\frac{4}{36}$	$\frac{5}{36}$	$\frac{6}{36}$	$\frac{5}{36}$	$\frac{4}{36}$	$\frac{3}{36}$	$\frac{2}{36}$	$\frac{1}{36}$
cdf $F(x)$	$\frac{1}{36}$	$\frac{3}{36}$	$\frac{6}{36}$	$\frac{10}{36}$	$\frac{15}{36}$	$\frac{21}{36}$	$\frac{26}{36}$	$\frac{30}{36}$	$\frac{33}{36}$	$\frac{35}{36}$	1

