5.1 Review (p 229)

5.10

x	5	7	8
f	25	40	60
P(X=x)	0.20	0.32	0.48

$P(X=5) = \frac{25}{125}$

a) Determine the probability distribution.

The relative frequency dist for a population is the probability dist for the corresponding variable.

$N = 125$

$P(X=7) = \frac{40}{125}$ $\quad P(X=8) = \frac{60}{125}$

b) X takes on the value 6 $\{X=6\}$

X " at most 6 $\{X \leq 6\}$

X " greater than 6 $\{X > 6\}$

"At most c" $X \leq c$

"At least c" $X \geq c$

c) $P(X=6)$, $P(X \leq 6)$ & $P(X>6)$

$P(X=6) = 0$

$P(X \leq 6) = P(X=5) = 0.2$

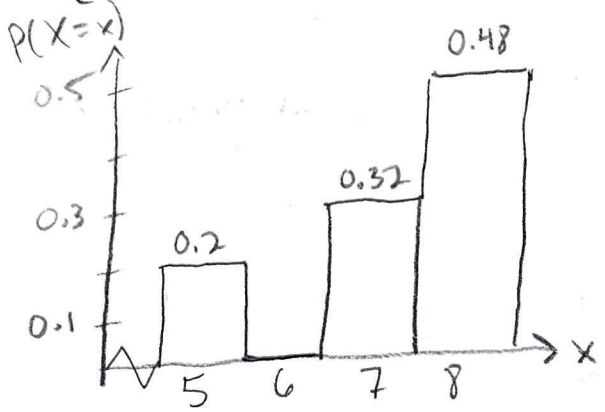
$P(X>6) = P(X=7 \text{ or } X=8)$

$= P(X=7) + P(X=8)$

$= 0.32 + 0.48$

$= 0.8$

$\{X>6\}$ is the complement of $\{X \leq 6\}$



5.11

X = crew size	2	4	5	6	7	8	
frequency	4	3	36	28	63	1	total: 135

Crew size of 7 $\{X = 7\}$

Find $P(X = 4) = 3/135 = 0.022$ → 2.2% of shuttle missions had a 4-person crew.

Probability Distribution

X	2	4	5	6	7	8
P(X=x)	0.030	0.022	0.267	0.207	0.467	0.007

$P(X=2) = \frac{4}{135} = 0.030$

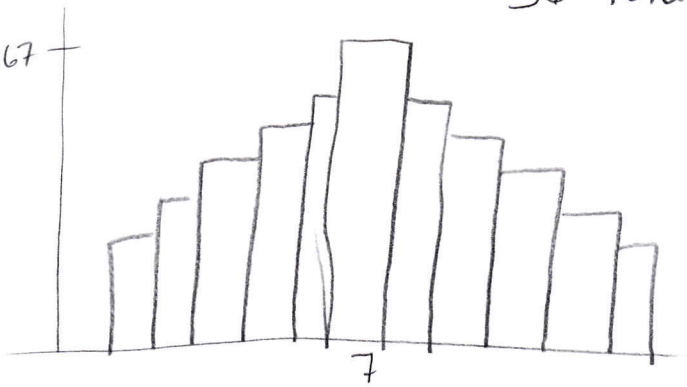
Y	2	3	4	5	6	7	8	9	10	11	12
f	1	2	3	4	5	6	5	4	3	2	1
P(Y=y)	0.028	0.056	0.083	0.111	0.139	0.167	0.139	0.111	0.083	0.056	0.028

36 total

Sum is 7: $\{Y = 7\}$

36 total

$P(Y = 7) = 6/36 = \frac{1}{6} = 0.167$



Symmetric distribution

$P(Y < 4) = P(Y = 3 \text{ or } Y = 2)$

$= P(Y = 3) + P(Y = 2)$

$P(4 < Y < 6) = P(Y = 5)$

$P(4 \leq Y < 6) = P(Y = 4 \text{ or } Y = 5)$

$= P(Y = 4) + P(Y = 5)$