Ans 2. Prior Probability Maine = 0.05
Sahara = 0.95

Let L be temperature recorded below 80.

(A) $P(L/M) = 0.8$ (1 − 0.2) low temp in Sahara
$P(L/S) = 0.1$

$$P(M/L) = \frac{P(M) \cdot P(L/M)}{P(M) \cdot P(L/M) + P(S) \cdot P(L/S)}$$

$$= \frac{0.05 \times 0.8}{0.005 \times 0.8 + 0.95 \times 0.1} = \frac{0.04}{0.04 + 0.095}$$

$$P(M/L) = 0.2963$$

(B) Probability in Maine → 29.63%.
Sahara → 70.37%.

$$P(\text{low}) = 0.29 \times 0.8 + 0.7037 \times 0.1$$
$$= 0.232 + 0.0703$$
$$= 0.3023$$

(C) $$P(\text{low}) = 0.3023 \times 0.8 + 0.7037 \times 0.1$$
$$= 0.2414 + 0.07037$$
$$= 0.31177$$

Task 3

a) Distribution table

Variable A has 5 values

$B_1, \ldots B_{10}$ have 7 each

So, $7 * 10 * 5 + 5 = 355$ values

b) Reduced would be:

$6 * 10 * 5 + (5-1) = 304$ values