Form A

1. (a) nests
   (b) 187
   (c)

variable	type
birth result (hatched or lost)	categorical
temperature (cold, neutral, hot)	categorical

   (d) This is an experiment, as researchers dictate, not merely observe, the temperature of the nest.
   (e) $P(\text{cold}) = \frac{27}{187}$
   (f) $P(\text{cold or lost}) = P(\text{cold}) + P(\text{lost}) - P(\text{cold and lost}) = \frac{27+58-11}{187} = \frac{74}{187}$
   (g) $P(\text{neutral and lost}) = \frac{18}{187}$
   (h) $P(\text{cold} \mid \text{hatched}) = \frac{P(\text{cold and hatched})}{P(\text{hatched})} = \frac{16/187}{129/187} = \frac{16}{129}$.
   (i) Letter (ii): side-by-side bar graphs
2. Letter (a)
3. (a) The variables involved, "used a night light" (yes/no) and "develops myopia" (yes/no), are categorical. Correlation requires quantitative variables.
   (b) A probability needs to be between 0 and 1.
   (c) This sample of size 1 is representative of her son, but not necessarily of any larger population. Even if it were representative, the data is observational and can, at best, establish an association, not a causal relationship.
4. Letter (b)
7. $\bar{x} = \frac{1}{4}(11+36+23+34) = \frac{1}{4}(104) = 26$

$$\text{Var} = \frac{1}{3}\left[(11-26)^2 + (36-26)^2 + (23-26)^2 + (34-26)^2\right]$$

$$= \frac{1}{3}(225 + 100 + 9 + 64) = \frac{1}{3}(398)$$

$$s = \sqrt{\frac{398}{3}} \doteq 11.518$$

8. (a) II $\leftrightarrow$ (a), III $\leftrightarrow$ (b), I $\leftrightarrow$ (c), IV $\leftrightarrow$ (d)

(b) It is (roughly) symmetric and bimodal.

(c) The median is larger.

(d) III

(e) 2.3, 6.1, 7.4, 8.8, 13

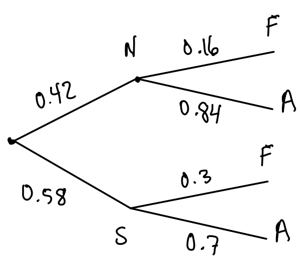
9. (a) $P(X \geq 5) = P(X=5) + P(X=7) = 0.25 + 0.3 = 0.55$

(b) $P(X = 3) = 0.3$.

(c) $\mu_X = (3)(0.3) + (4)(0.15) + (5)(0.25) + (7)(0.3)$

$= 0.9 + 0.6 + 1.25 + 2.1 = 4.85$

10. (a) N means North station, S means South, F means fire truck only, A means ambulance



$P(A) = P(N \text{ and } A) + P(S \text{ and } A)$

$= P(N)\,P(A \mid N) + P(S)\,P(A \mid S)$

$= (0.42)(0.84) + (0.58)(0.7)$

$= 0.7588$

(b) $P(N \mid A) = \dfrac{P(A \mid N)\ P(N)}{P(A)} = \dfrac{(0.42)(0.84)}{0.7588} \doteq 0.465$