Homework due March 11

Assigned exercises: Ch.3, OpenStax book, pg. 215-217, ex. 2, 4, 20, 38, 42, 43.
And from linked supplement: 5, 10, 19, 21, 27, 29, 31, 40, 42, 44. (16 exercises total)
Graded exercises: From Ch.3, OpenStax book: 2 and 4 (as one exercise), 42.
From linked supplement: 10(a and c), 27, 42.
Total (maximum) possible points = 20.
3 pt for each of 5 graded problem sets, plus 5 for completion of the rest.
-0.5 pt for each (ungraded) missing problem; if a graded problem is missing, student loses the 3 points allotted to it.

Exercises from Ch.3, OpenStax

(2 and 4) (2) Total # of party favors = 12 + 15 + 10 + 5 = 42.
Number of hats = 12. Therefore, $\boxed{P(H) = \frac{12}{42} = \frac{2}{7}}$

(4) Number of finger traps = 10. Therefore, $\boxed{P(F) = \frac{10}{42} = \frac{5}{21}}$

Grade: 1.5 pt. for each of the 2 exercises.
For each case: 1pt = correct answer; 0.5 pt = show calculation step, or write answer as fraction with clear/correct numerator & denominator.

(42) Given $P(U) = 0.26, P(V) = 0.37$, and that they are mutually exclusive events.

(a) Answer: $P(U \text{ and } V) = 0$.
Reason: It is impossible for mutually exclusive events to occur together.

(b) Answer: $P(U \mid V) = 0$.
Reason: Pretty much the same – if V is given, then it is impossible for U to occur.

(c) Answer: $P(U \text{ or } V) = 0.26 + 0.37 = 0.63$.
Reason: Since U, V are mutually exclusive, the simple addition rule can be used.

Grade: 1 pt for each of (a)-(c).
I would not be comfortable giving full credit for correct answers alone here. But, in the spirit of making this a "teaching moment," I would deduct 0.5 to 1 point total (for all 3 Qs) depending on the extent of missing steps/reasons.

Exercises from linked supplement

(10) (a) The sample space is

$$S = \{2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$$

No, these outcomes are not equally likely, since some of them can only occur in only one way (e.g, 2), while others (e.g., 6) can occcur in many ways.

(b) Not graded.

(c) The sample space is

$$S = \{0, 1, 2, 3, 4\}$$

These outcomes are not equally likely. Getting 2 heads and 2 tails is more likely than all 4 tails, or 0 tails.

(d) Not graded. But the answer is

$$S = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}. \quad \text{Not equally likely.}$$

Grade: Only (a) and (c) are graded. (a)=(c)=1.5 pt each.
For each: 1pt = correct sample space + 0.5pt=correct answer for equally likely.

(27) Given info: One repair = 17%. Two repairs = 7%. Three or more repairs = 4%.

(a) Probability of no repairs = $100 - (17 + 7 + 4)$ $\boxed{= 72\% \quad \text{OR} \quad 0.72}$ (Answer)
[NOTE: Adding/subtracting probabilities in % form is acceptable.]

(b) Probability of no more than 1 repair = $\boxed{17 + 72 = 89\% \quad \text{OR} \quad 0.89}$
Another way to get the same result: $100 - (7 + 4) = 89\%$

(c) Probability of some repairs = P(one OR two OR three or more) = $17 + 7 + 4$ $\boxed{= 28\% \quad \text{OR} \quad 0.28}$ (Answer)

(42) (a) Type A and Type B are disjoint (or, mutually exclusive) events, because it is not possible for the same individual to have both blood types.

(b) If the two individuals are randomly selected, then the first being Type A, and the second Type B are likely independent events. Otherwise, if not random, they could be family members and have the same blood type, resulting in the loss of independence.

(c) No disjoint events are always dependent because if one of them occurs, it makes the probability of the other zero. If they were independent, then they would have no effect on each others' probability.

Grade: (a)=(b)=(c)=1 point each.
For each: 0.5+0.5 pt for correct answer + some reasoning.