[§6.5] 14. $\binom{4+17-1}{17} = 1140$ solutions

29. All such strings begin with `1-0-0`, then contain 3 units of `1-0-0` and 4 units of `0`. Thus there are $\binom{3+4}{3} = \boxed{\text{35 different bit strings}}$.

35. EVERGREEN has 4 E, 2 R, 1 V, 1 G, 1 N. There are three cases to consider; the number of

- *7-character strings* leaving out two letters is:
  - (E,E): $\frac{7!}{2!2!}$
  - (E,R): $\frac{7!}{3!}$
  - (E,V), (E,G), (E,N): $\frac{3 \cdot 7!}{3!2!}$
  - (R,R), (R,V), (R,G), (R,N): $\frac{4 \cdot 7!}{4!}$
  - (V,G), (V,N), or (G,N): $\frac{3 \cdot 7!}{4!2!}$
- *8-character strings* leaving out one letter is:
  - E: $\frac{8!}{3!2!}$
  - R: $\frac{8!}{4!}$
  - V, G, N: $\frac{8!}{4!2!}$
- *9-character strings* is:
  - $\frac{9!}{4!2!}$

Summing over all cases gives $\boxed{\text{19,635 strings}}$.

36. $\binom{14}{6} = 3003$ solutions

[§7.1] 3. $p = \frac{1}{2} = 0.5$

7. $p = \left(\frac{1}{2}\right)^6 \approx 0.016$

12. $p = \frac{\binom{4}{1}\binom{52-4}{4}}{\binom{52}{5}} \approx 0.299$

21. $p = \left(\frac{3}{6}\right)^6 \approx 0.016$

23. There are $\left\lfloor \frac{100}{5} \right\rfloor + \left\lfloor \frac{100}{7} \right\rfloor - \left\lfloor \frac{100}{5 \cdot 7} \right\rfloor = 32$ such integers. Thus $\boxed{p = \frac{32}{100} = 0.32}$.

31. $p = \frac{3}{100} = 0.03$

33. (a) $p = \frac{1}{200 \cdot 199 \cdot 198} \approx 1.27 \times 10^{-7}$

    (b) $p = \frac{1}{200^3} = 1.25 \times 10^{-7}$

36. Probability of rolling a total of 8 with

    - *two dice:* $\frac{2 \cdot \mathbf{card}(\{(2,6),(3,5),(4,4)\}) - 1}{6^2} = \frac{5}{36} = \frac{30}{216}$
    - *three dice:* $\frac{6 \cdot \mathbf{card}(\{(1,2,5),(1,3,4)\}) + 3 \cdot \mathbf{card}(\{(1,1,6),(2,2,4),(3,3,2)\})}{6^3} = \frac{21}{216}$

    **card**() is set cardinality

    Therefore, $\boxed{\text{rolling a total of 8 with two dice is more likely}}$.