

1. Sample

$$2. P(A) = 0.004$$

$$P(\bar{A}) = 1 - P(A) = 1 - 0.004 \\ = 0.996$$

$$3. \text{Total chips} = 20 + 1050 \\ = 1070$$

$$P(\text{Defective}) = \frac{20}{1070} = 0.0187 \\ = 1.87\%$$

4. Disjoint

5. Independent

$$6. a) P(A) = \frac{122 + 18}{1117} = \frac{140}{1117} = 0.1253 \\ = 12.53\%$$

$$b) P(A \cap \text{Not accurate}) = P(A | \text{Not accurate}) \cdot P(\text{Not accurate})$$

$$= \frac{38}{142} \cdot \frac{142}{1117} = \frac{38}{1117} = 0.03402$$

$$= 3.402\%$$

$$(c) P(\text{Not accurate or } C) = P(\text{Not accurate}) + P(C) - P(\text{Not accurate} \cap C)$$

$$= \frac{142}{1117} + \frac{274}{1117} - \frac{30}{1117}$$

$$= \frac{386}{1117} = 0.3456$$

$$= 34.56\%$$

$$(d) P = \frac{335}{1117} \times \frac{334}{1116} = 0.0898$$

7. $p = 0.24$

$$x = 1$$

$$n = 6$$

$$P(X \geq 1) = 1 - P(X = 0)$$

$$P(X = 0) = {}_n C_x \cdot p^x (1-p)^{n-x}$$

$$= {}_6 C_0 (0.24)^0 (1-0.24)^6$$

$$= 0.1927$$

$$P(X \geq 1) = 1 - 0.1927$$

$$= 0.8073$$

8.

$$= {}_{30} C_7 = 2035800$$

$$9. (a) P = \frac{P(\text{Purchased Gum} \cap \text{Given 4 quarters})}{P(\text{Given 4 quarters})}$$

$$= \frac{29}{44} = 0.6591$$

$$(b) P = \frac{P(\text{Kept the money} \cap \text{given \$1 bill})}{P(\text{Given \$1 bill})}$$

$$= \frac{25}{37} = 0.6757$$

$$10. (a) P(\text{Yes})$$

$$P(\text{Positive} | \text{Yes}) = \frac{P(\text{Positive} \cap \text{Yes})}{P(\text{Yes})}$$

$$= \frac{126}{158} = 0.7975$$

$$(b) P(\text{No} | \text{Negative}) = \frac{P(\text{No} \cap \text{Negative})}{P(\text{Negative})}$$

$$= \frac{131}{163} = 0.8067$$

$$11. (a) P(\text{Purple}) = \frac{3}{16} \cdot \frac{3}{16} \cdot \frac{3}{16} \\ = 0.00659$$

$$(b) P = 1 - P(\text{No yellow})$$

$$= 1 - \left(\frac{{}^{11}C_5}{{}^{16}C_5} \right)$$

$$= 1 - \frac{11}{104} = 0.8942$$

$$12. {}^{40}C_5 = 658008$$

$$13. (a) P = P(2) + P(3) \\ = 0.179 + 0.022 \\ = 0.201$$

$$\begin{aligned} (b) \quad X_{\text{mean}} &= 0(0.366) + 1(0.433) + 2(0.179) \\ &\quad + 3(0.022) \\ &= 0.857 \end{aligned}$$

$$\begin{aligned} \text{Standard deviation} &= \sqrt{0.1347 - (0.857)^2} \\ &= 0.7827 \end{aligned}$$

$$14 \quad p = 0.8$$

$$X = 2$$

$$n = 6$$

$$P(X \geq 2) = 1 - (P(X=0) + P(X=1))$$

$$= 1 - (0.000064 + 0.001536)$$

$$= 0.9984$$

$$15 \quad (a) \quad P(X \geq 3) = 1 - (P(X=0) + P(X=1) + P(X=2))$$

$$= 0.15394$$

$$(b) \quad \checkmark \quad 2 \times 6 \neq$$

$$\mu = np = 0.2 \times 6$$

$$= 1.2$$

$$(c) \quad \sigma = \sqrt{np(1-p)} = \sqrt{0.2(6)(1-0.2)}$$

$$= 0.9798$$

Part 2

$$\frac{5}{8} = 0.625$$

It is not significantly high