

1. $A \times x \times \underline{1} \underline{2} \underline{0}$

Letter = 26 Digit = 10

$$26 \times 26 \times P(3,2) \times 10 = 40560$$

2. ⑪ 1 1 1 1 1 1 1 1 7/10

a) $C(2) \times C(8) = \frac{8 \cdot 7 \cdot 6}{3 \cdot 2 \cdot 1} = 56$

b) $C(6) \times C(4) + C(5) \times C(4) + C(6) \times C(4) = 15 \times 4 + 6 \cdot 6 + 1 \times 4 = 100$

3. a)

S	A	P	Q	R	P A Q	R A Q	P S R A Q	S V A	X	Y
1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	0	1	0	0	1	1	1
1	1	1	0	0	0	0	0	1	1	1
1	1	1	0	1	0	0	0	1	1	1
1	1	0	1	1	0	1	1	1	1	1
1	1	0	0	1	0	0	1	1	1	1
1	1	0	1	0	0	0	1	1	1	1
1	1	0	0	0	0	0	1	1	1	1
1	0	1	1	1	1	1	1	1	1	1
1	0	1	1	0	1	0	0	1	1	1
1	0	1	0	0	0	0	0	1	1	1
1	0	1	0	1	0	0	0	1	1	1
1	0	0	1	1	0	1	1	1	1	1
1	0	0	0	1	0	0	1	1	1	1
1	0	0	1	0	0	0	1	1	1	1
1	0	0	0	0	0	0	1	1	1	1

3. b)

$$\begin{array}{c}
 \textcircled{p \wedge q} \\
 p \rightarrow (r \wedge q) \\
 r \rightarrow (s \vee \star) \\
 \hline
 \neg s \\
 \hline
 \therefore \star
 \end{array}
 \rightarrow
 \begin{array}{c}
 \textcircled{r \wedge q} \\
 r \rightarrow s \vee \star \\
 \hline
 \neg s \\
 \hline
 \therefore \star
 \end{array}
 \rightarrow
 \begin{array}{c}
 r \\
 r \rightarrow s \vee \star \\
 \hline
 \neg s \\
 \hline
 \therefore \star
 \end{array}$$

$$\rightarrow
 \begin{array}{c}
 \textcircled{s \vee \star} \\
 \hline
 \neg s \\
 \hline
 \therefore \star
 \end{array}
 \rightarrow
 \boxed{\frac{\star}{\therefore \star} \equiv 1}$$

4. $p \equiv$ she can program in C++
 $q \equiv$ she can program in java
 $r \equiv$ she will apply to the academy

$P_1 \equiv p \vee q$
 $P_2 \equiv p \leftarrow r$
 $P_3 \equiv \neg r$
 $P_4 \equiv q$

$$\begin{array}{c}
 \textcircled{p \vee q} \\
 p \leftarrow r \\
 \hline
 \neg r \\
 \hline
 \therefore q
 \end{array}
 \rightarrow
 \begin{array}{c}
 q \\
 \textcircled{r} \\
 \hline
 \neg r \\
 \hline
 \therefore q
 \end{array}
 \rightarrow
 \boxed{\frac{q}{\therefore q}}$$