1. $\Pr(\text{over 60}\,|\,\text{acc.}) = \dfrac{0.10\times 0.04}{(0.05\times 0.06)+(0.10\times 0.04)+(0.25\times 0.02)+(0.20\times 0.015)+(0.30\times 0.025)+(0.10\times 0.04)}$

$= \dfrac{0.004}{0.0265}$

$= \dfrac{8}{53}$

2. $\Pr(\text{type 1}\,|\,\text{fail.}) = \dfrac{0.30\times 0.0002}{(0.3\times 0.0002)+(0.25\times 0.0004)+(0.2\times 0.0005)+(0.1\times 0.001)+(0.05\times 0.002)+(0.1\times 0.004)}$

$= \dfrac{3}{43}$

3. $\Pr(\text{sophomore}\,|\,\text{A}) = \dfrac{0.30\times 0.4}{(0.10\times 0.2)+(0.30\times 0.4)+(0.40\times 0.3)+(0.20\times 0.1)} = \dfrac{0.12}{0.28} = \dfrac{3}{7}$

4. $\Pr(\text{precinct 3}\,|\,\text{larceny}) = \dfrac{0.40\times 0.05}{(0.20\times 0.01)+(0.10\times 0.02)+(0.40\times 0.05)+(0.30\times 0.04)} = \dfrac{5}{9}$

5. $\Pr(\geq \$75,000\,|\,2 \text{ or more cars}) = \dfrac{0.05\times 0.9}{(0.10\times 0.2)+(0.20\times 0.5)+(0.35\times 0.6)+(0.30\times 0.75)+(0.05\times 0.9)}$

$= \dfrac{0.045}{0.6}$

$= \dfrac{3}{40}$

$= 0.075$

6. $\Pr(\text{reg. Indep.}\,|\,\text{turned out}) = \dfrac{0.30\times 0.7}{(0.50\times 0.4)+(0.20\times 0.5)+(0.30\times 0.7)} = \dfrac{7}{17}$

7. $\Pr(\text{passed exam}\,|\,\text{A}) = \dfrac{0.80\times 0.40}{0.80\times 0.40+0.20\times 0.20}$

$= \dfrac{0.32}{0.36}$

$= \dfrac{8}{9}$

8. a. $(0.07\times 0.51)+(0.20\times 0.51)+(0.33\times 0.50)+(0.27\times 0.48)+(0.13\times 0.44) = 0.4895$

b. $\Pr(\text{5 to 19}\,|\,\text{male}) = \dfrac{0.20\times 0.51}{0.4895} \approx 0.2084$

17. $$\Pr(\text{Male}|\text{Clinton}) = \frac{\Pr(\text{Male}) \times \Pr(\text{Clinton}|\text{Male})}{\Pr(\text{Male}) \times \Pr(\text{Clinton}|\text{Male}) + \Pr(\text{Female}) \times \Pr(\text{Clinton}|\text{Female})}$$
$$= \frac{0.43 \times 0.57}{(0.43 \times 0.57) + (0.57 \times 0.70)} = \frac{0.2451}{0.2451 + 0.399} = \frac{43}{113} \approx 0.3805$$

18. $$\Pr(\geq \$50{,}000|\text{Repub.}) = \frac{\Pr(\geq \$50,000) \times \Pr(\text{Repub.}|\geq \$50,000)}{\Pr(\geq \$50,000) \times \Pr(\text{Repub.}|\geq \$50,000) + \Pr(< \$50,000) \times \Pr(\text{Repub.}|< \$50,000)}$$
$$= \frac{0.64 \times 0.55}{(0.64 \times 0.55) + (0.36 \times 0.43)} = \frac{0.352}{0.352 + 0.1548} \approx 0.6946$$

19. a. $$\Pr(\text{one is}) = \frac{13}{52} = \frac{1}{4}$$

b. $$\Pr(\text{none is}|\text{random one isn't})$$
$$= \frac{\Pr(\text{none is}) \times (\text{random one isn't}|\text{none is})}{\Pr(\text{none is}) \times \Pr(\text{random one isn't}|\text{none is}) + \Pr(\text{one is}) \times \Pr(\text{random one isn't}|\text{one is})}$$
$$= \frac{\frac{3}{4} \times 1}{\left(\frac{3}{4} \times 1\right) + \left(\frac{1}{4} \times \frac{12}{13}\right)} = \frac{13}{17} \approx 0.765$$

c. $$\Pr(\text{one is}|\text{10 randoms aren't})$$
$$= \frac{\Pr(\text{one is}) \times \Pr(\text{10 randoms aren't}|\text{one is})}{\Pr(\text{one is}) \times \Pr(\text{10 randoms aren't}|\text{one is}) + \Pr(\text{none is}) \times \Pr(\text{10 randoms aren't}|\text{none is})}$$
$$= \frac{\frac{1}{4} \times \left(\frac{12}{13}\right)^{10}}{\left[\frac{1}{4} \times \left(\frac{12}{13}\right)^{10}\right] + \left(\frac{3}{4} \times 1\right)}$$
$$\approx .130$$

20. $$\Pr(\text{section I}|\text{math major}) = \frac{\#\text{ of section I math majors}}{\#\text{ of math majors}}$$
$$= \frac{5}{16}$$

21. a. $$\Pr(\text{Lakeside}|\text{winner})$$
$$= \frac{\Pr(\text{Lakeside}) \times \Pr(\text{winner}|\text{Lakeside})}{\Pr(\text{Lakeside}) \times \Pr(\text{winner}|\text{Lakeside}) + \Pr(\text{Pylesville}) \times \Pr(\text{winner}|\text{Pylesville})}$$
$$+ \Pr(\text{Millerville}) \times \Pr(\text{winner}|\text{Millerville})$$
$$= \frac{0.40 \times 0.05}{(0.40 \times 0.05) + (0.20 \times 0.02) + (0.40 \times 0.03)} = \frac{5}{9}$$

b. $\dfrac{0.20\times 0.02}{(0.40\times 0.05)\times(0.20\times 0.02)+(0.40\times 0.03)}=\dfrac{1}{9}\approx 11\%$

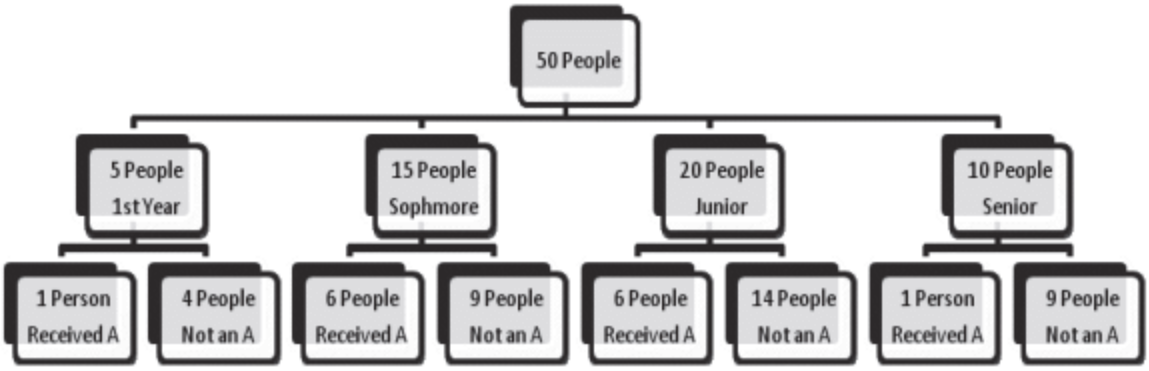
22. $\Pr(\text{Apex}|\text{def.}) = \dfrac{\Pr(\text{Apex})\times\Pr(\text{def.}|\text{Apex})}{\Pr(\text{Apex})\times\Pr(\text{def.}|\text{Apex})+\Pr(\text{B-ink})\times\Pr(\text{def.}|\text{B-ink})}$

$$=\frac{0.70\times 0.10}{(0.70\times 0.10)+(0.30\times 0.05)}$$

$$=\frac{14}{17}$$

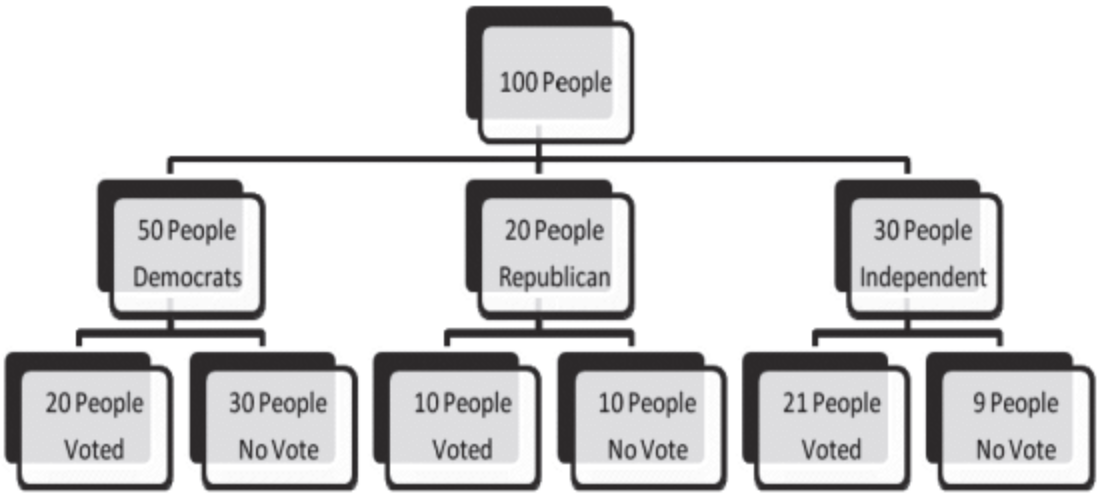
$$\approx 0.824$$

23.



$$\Pr(\text{Sophmore} \mid \text{A}) = \frac{6}{1+6+6+1} = \frac{6}{14} = \frac{3}{7}$$

24.



$$\Pr(\text{Independent} \mid \text{Voted}) = \frac{21}{21+10+21} = \frac{21}{51} = \frac{7}{17}$$