① $n(S) = C(24,4) = 10626$

$n(E) = C(20,3) \times C(4,1) + C(20,4) = 9405$

3 A and 1 M OR 4 A

$Pr(E) = \frac{9405}{10626} \approx 0.89$

②

	X = net winnings	P(X)
\$500 prize	480	$\frac{1}{200}$
\$10 prize	−10	$\frac{20}{200}$
no prize	−20	$\frac{179}{200}$

$E(x) = 480\left(\frac{1}{200}\right) - 10\left(\frac{20}{200}\right) - 20\left(\frac{179}{200}\right)$

$= -16.5$

Expect to lose \$16.50 on each ticket

③ Pr (at least one passes)

$= 1 - Pr(\text{all fail})$

$= 1 - Pr(\text{Ali fails}) \times Pr(\text{Beiyan fails}) \times Pr(\text{Glin fails})$

INDEPENDENT

$= 1 - 0.25 \times 0.17 \times 0.29$

≈ 0.9877

④ $Pr(E \cup F) = Pr(E) + Pr(F) - Pr(E \cap F)$

$0.65 = 0.4 + 0.5 - Pr(E \cap F)$

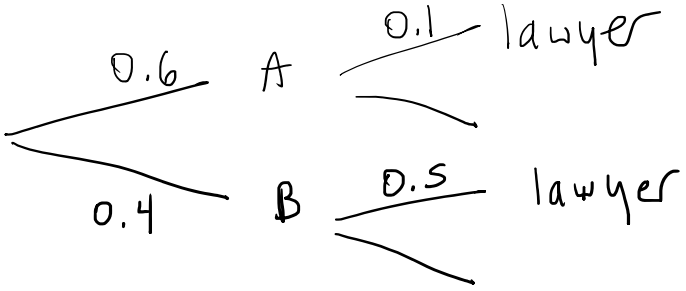
$Pr(E \cap F) = 0.25$

Now $Pr(F|E) = \dfrac{Pr(F \cap E)}{Pr(E)}$

$= \dfrac{0.25}{0.4}$

$= 0.625$

⑤



$Pr(B|\text{lawyer}) = \dfrac{Pr(B \text{ and lawyer})}{Pr(\text{lawyer})}$

$= \dfrac{0.4(0.5)}{[0.6(0.1) + 0.4(0.5)]}$

≈ 0.77