10/ $p = 0.985$ $p(\text{fail}) = 0.015$

(a) $0.015 \cdot 0.015 = 0.000225$

(b) at least one satisfactory

$= 1 - \text{Prob}(\text{neither working})$

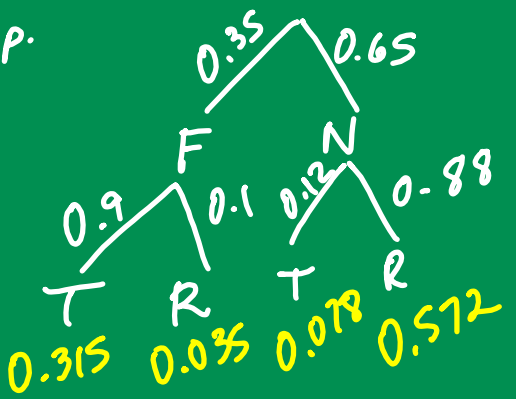
$= 1 - 0.000225$

$= 0.999775$

CONDITIONAL PROBABILITY

– Known fact about situation

Flu epidemic – 35% of students have flu
- – of those with flu, 90% have temperature
- – 12% of those with other illnesses also have a temp.



$P(FT) = 0.315$

$P(NR) = 0.572$

$P(T) =$ FT OR NT

$= 0.315 + 0.078$

$= 0.393$

If a student with a normal temp is selected, what is the prob he/she has the flu?

$$P(F \mid R) = \frac{P(FR)}{P(R)} = \frac{0.035}{0.035 + 0.572} = 0.0577$$

find ← $P(F \mid R)$ → given, know

$$P(A \mid B) = \frac{P(AB)}{P(B)}$$

Expected Value (Fair Game Theory)

Dice Game – Pay $1 to play.

Event	1, 2, 3	4, 5	6
Gain/Loss	Win $~~10~~ 9	Lose $~~36~~ 31	Win $~~25~~ 24
Prob.	$\frac{3}{6} = \frac{1}{2}$	$\frac{2}{6} = \frac{1}{3}$	$\frac{1}{6}$

Expected Value = (Gain/Loss)(Probability)

$E.V. = (9)(\frac{1}{2}) + (-31)(\frac{1}{3}) + (24)(\frac{1}{6}) = -1.83$

Player lose $1.83/game

Owner makes $1.83/game

	Total car	$5000 Accid	$1000 Accid	No Accid.
Prob	0.05	0.02	0.03	0.9
Gain/ Loss	10,000 −500 −1400 8100	5000 −500 −1400 3100	1000 −500 −1400 −900	−1400

$1400 per year
$500 deductible
Car worth $10,000

$$E.V. = (0.05)(8100) + (0.02)(3100) + (0.03)(-900) + (0.9)(-1400) = -\$820 \text{ per yr}$$