1.

1.1.

Given,

	Bad	Good
Battery	0.1	0.9

	Empty	Not empty
Fuel	0.2	0.8

Battery	Fuel	Gauge	
		Empty	Not empty
Bad	**Empty**	0.9	0.1
Bad	**Not empty**	0.2	0.8
Good	**Empty**	0.8	0.2
Good	**Not empty**	0.1	0.9

Battery	Fuel	Start	
		No	Yes
Bad	**Empty**	1	0
Bad	**Not empty**	0.9	0.1
Good	**Empty**	0.8	0.2
Good	**Not empty**	0.1	0.9

(a) P(B = bad, F = empty, G = empty, S = no) = 0.1 X 0.2 X 0.9 X 1 = **0.018**

(b) P(S=No | F=Not Empty) = P(S = No, F = Not Empty)/ P(F = Not Empty)
= (P(F = Not empty, B = Bad, S = No) + P(F = Not empty, B = Good, S = No))/ P(F = Not Empty)
= ((0.8 X 0.1 X 0.9) + (0.8 X 0.9 X 0.1))/0.8
= (0.072 + 0.072)/0.8
= 0.144/0.8
= **0.18**

(c) P(G = Empty | Battery = Bad, Start = No) = P(B = Bad, S = No, G = Empty)/ P(B = Bad, S = No)
= (P(B = Bad, F = Empty, S = No, G = Empty) + P(B = Bad, F = Not Empty, S = No, G = Empty))/(P(B = Bad, F = Empty, S = No) + P(B = Bad, F = Not Empty, S = No))

= ((0.1 X 0.2 X 1 X 0.9) + (0.1 X 0.8 X 0.9 X 0.2))/ ((0.1 X 0.2 X 1) + (0.1 X 0.8 X 0.9))
= (0.018 + 0.0144)/(0.02 + 0.072)
= 0.0324/0.092
= **0.3522**