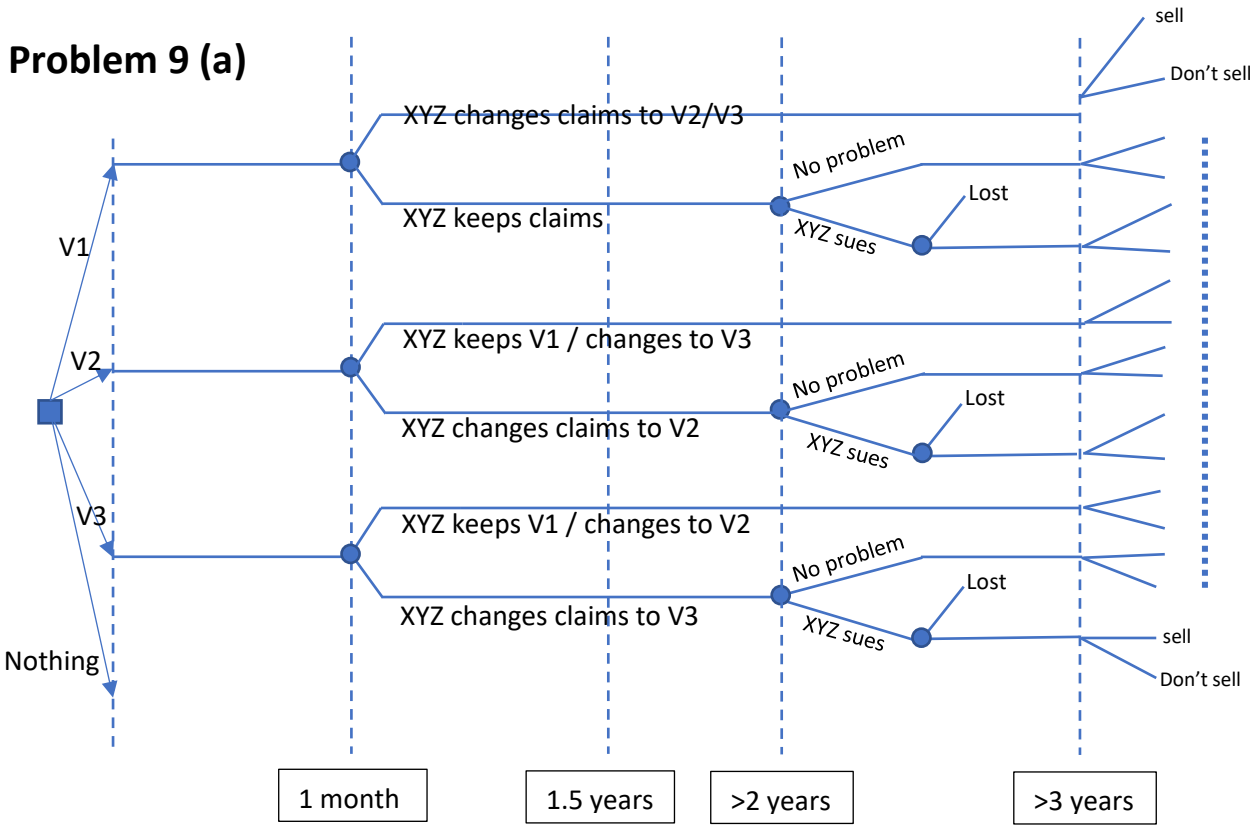
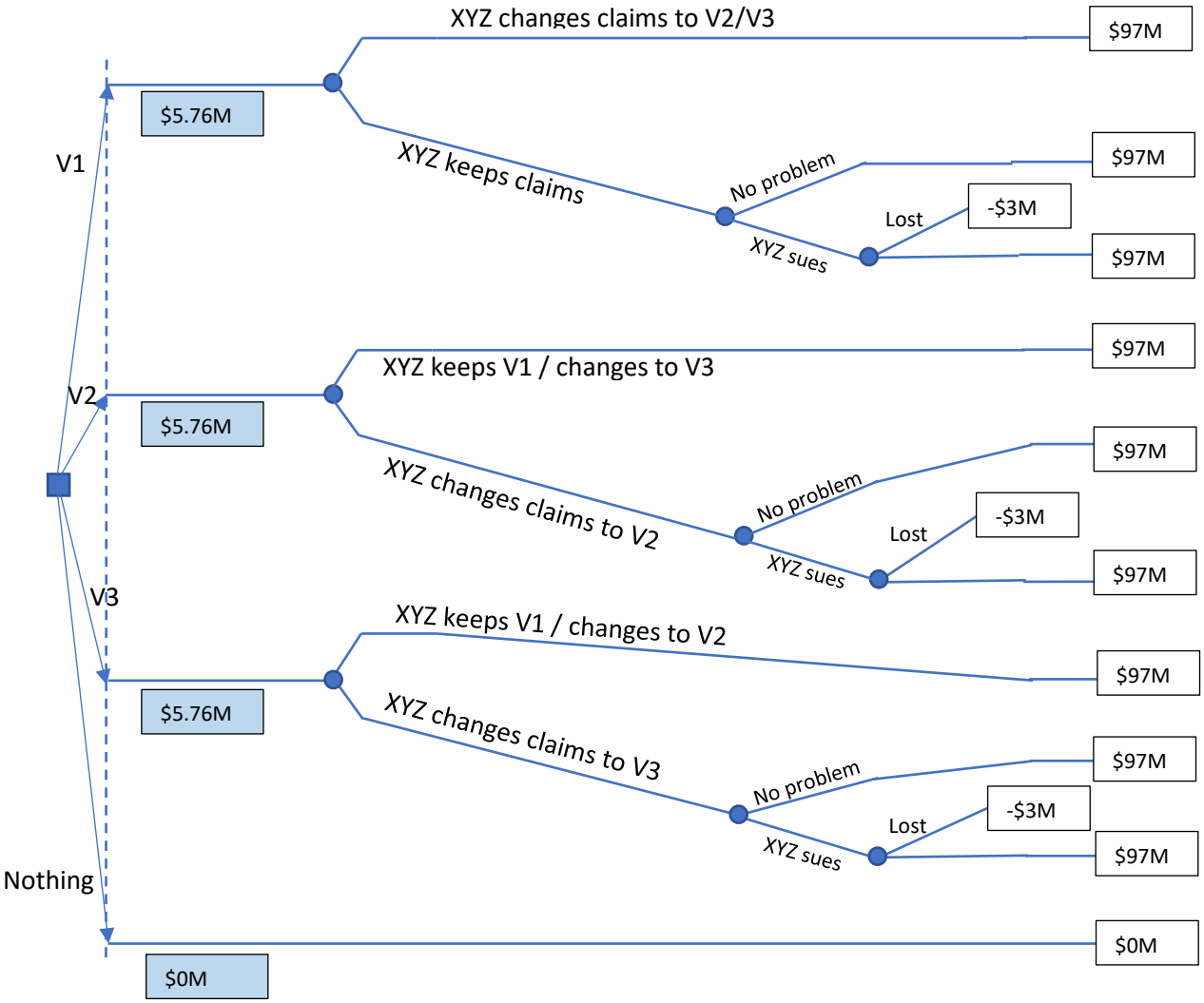
Problem 9 (a)


sell
Don't sell
XYZ changes claims to V2/V3
No problem
Lost
XYZ keeps claims
XYZ sues
V1
XYZ keeps V1 / changes to V3
V2
No problem
Lost
XYZ changes claims to V2
XYZ sues
V3
XYZ keeps V1 / changes to V2
No problem
Lost
XYZ changes claims to V3
XYZ sues
sell
Nothing
Don't sell
1 month
1.5 years
>2 years
>3 years

Problem 9 (b)


V1
$5.76M
XYZ changes claims to V2/V3
$97M
XYZ keeps claims
No problem
$97M
Lost
-$3M
XYZ sues
$97M
V2
$5.76M
XYZ keeps V1 / changes to V3
$97M
XYZ changes claims to V2
No problem
$97M
Lost
-$3M
XYZ sues
$97M
V3
$5.76M
XYZ keeps V1 / changes to V2
$97M
XYZ changes claims to V3
No problem
$97M
Lost
-$3M
XYZ sues
$97M
Nothing
$0M
$0M

Calculations:

As every main decision branch (V1/V2/V3/don't manufacture) has similar sub-branches, let us look at one (V1) of these calculations:

Decision branch 1:

Probability that XYZ choses to claim V2/V3 is highly unlikely, given that it knows my company is going for V1: 0.02

In this rare case, XYZ cannot sue my company and I can sell V1. Total cash flow: -$3M (factory setup) + $100M (revenue) = $97M

Decision branch 2:

Probability that XYZ choses to claim V1 is highly likely, given that it knows my company is going for V1: 0.98

XYZ decides to sue (highly likely, P = 0.98)

XYZ wins (highly likely, P = 0.95)

In this very likely case, my company will face injunction i.e. no sell of V1. Total cash flow: -$3M, total probability = 0.98*0.98*0.95

XYZ loses (highly unlikely, P = 0.05)

In this rare case, my company can sell V1. Total cash flow: $97M, total probability = 0.98*0.98*0.05

XYZ decides not to sue (highly unlikely, P = 0.02)

In this another rare case, my company can sell V1. Total cash flow: $97M, total probability = 0.98*0.02

Expected value for decision of manufacturing V1/V2/V3 = 0.02*97 + 0.98*0.98*0.95*(-3) + 0.98*0.98*0.05*97 + 0.98*0.02*97 = $5.762M

Expected value for decision of not manufacturing = $0M

Problem 9 (c)

Manufacture V1: keep claims to V1

Manufacture V2: change claims to V2

Manufacture V3: change claims to V3

Manufacture nothing: file patent with claims of either of V1/V2/V3

Problem 9 (d)

Best choice is to go for manufacturing of either of the types. All of these options have equal and maximum outcomes ($5.762M) in expectation. This decision is best made just after company XYZ confirms its patent claims.

Problem 9 (e)

Company XYZ will have the odds in its favor once it knows that my company has made a irreversible choice. This narrows down company XYZ's strategy to trap my company by choosing to file claims for the same product. This outcome will be highly likely in favor of company XYZ.