```
(* 1.1) *)
w = 10 000;
p = 1/6;
q = 100;
g = 600;

(* 1.1.1) *)
N[Sqrt[w]] == 100.`
N[Sqrt[p (g - q + w)] + 5 Sqrt[p (-q + w)]] == 244.93396144260282`

(* 1.1.2) *)
N[w] == 10000.`
N[p (g - q + w) + 5 p (-q + w)] == 10000.`

(* 1.1.3) *)
N[Sqrt[w]] == 100.`
N[p Sqrt[(g - q + w)] + 5 p Sqrt[(-q + w)]] == 99.99387103548433`
(* 1.1.4) Takes the bet*)
(* 1.1.5) Does not take bet *)

(* 1.1.6) *)
N[w^2]
N[p (g - q + w)^2 + 5 p (-q + w)^2]
```

$1. \times 10^{8}$

1.0005×10^{8}

```
(* 1.2) *)
k = 10;
t = 48;

(* 1.2.1) *)
(* L1= 0.1*(-1)+0.2*4+0.7*10
   Mean[{-5,5,10}] Payoff
   Mean[{w-5,w+5,w+10}] Wealth *)
(* L2= 0.01*(-20)+0.29*5+0.7*10
   Mean[{-20,5,10}] Payoff
   Mean[{w-20,w+5,w+10}] Wealth *)

w = 50;

N[Mean[{w - 5, w + 5, w + 10}]] - k * 0.1 * (w - 5 - t)^2 == 44.333333333333336`;
N[Mean[{w - 20, w + 5, w + 10}]] - k * 0.01 * (w - 20 - t)^2 == 15.933333333333337`;

(* 1.2.1) *)
k = 10;
t = 48;
w = 48;

N[Mean[{w - 5, w + 5, w + 10}]] - k * 0.1 * (w - 5 - t)^2 == 26.333333333333336`;
N[Mean[{w - 20, w + 5, w + 10}]] - k * 0.01 * (w - 20 - t)^2 == 6.333333333333336`;
```

```
(* 1.4) *)
Clear[k];
(* L1= 0.25*(10)+0.5*12+0.25*14 ;*)
Mean[{10, 12, 14}] == 12;
Variance[{10, 12, 14}] == 4;
(* L2= 0.5*8+0.5*20*)
Mean[{8, 20}] == 14;
Variance[{8, 20}] == 72;
U (L1) > (L2);
12 - k * 8 > 14 - k * 72;
Solve[12 - k * 8 == 14 - k * 72, k] == {{k → 1/32}}

(* 1.4.1) *)
(*L3= 0.5*4+0.5*50 *)
Mean[{4, 50}] == 27;
Variance[{4, 50}] == 1058;
Solve[12 - k * 8 == 27 - k * 1058, k] == {{k → 1/70}};

(* 1.4.2) *)
(*L4= 0.5*1+0.5*40 *)
Mean[{1, 40}] == 20.5`;
Variance[{1, 40}] == 760.5`;
Solve[20.5 - k * 760.5 == 14 - k * 72, k] == {{k → 13/1376}};

(* 1.5 *)
Mean[{0, 10 000}] == 5000;

Variance[{0, 10 000}] == 50 000 000;
(* 1.6.1 *)

(*L1= 0.8*0+0.2*(-100) *)
0.8 * 0 + 0.2 * (-100) == -20;

0.8 * (0 + 20)^2 + 0.2 * (-100 + 20)^2 == 1600

Sqrt[1600] == 40;

(* 1.6.2 *)

Clear[w];
w = 500;
0.8 * w + 0.2 (w - 100) == w - 20 == 480
0.8 * (w - w + 20)^2 + 0.2 * (w - 100 - w + 20)^2 == 1600
Sqrt[1600] == 40;

(* 1.6.3 *)
1/2 ((0.8)^2 * 0 + (0.2)^2 * (-200) + 2 * 0.2 * 0.8 (-100)) == -20;
(0.8)^2 * (0 + 20)^2 + (0.2)^2 * (-100 + 20)^2 + 2 * 0.2 * 0.8 (-50 + 20)^2 == 800;
Sqrt[800] == 20 Sqrt[2]
```