

LAMPIRAN

Lampiran 1. Perhitungan Kasus I dengan *Software* Maple

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> restart;  
>  $T := \sqrt{\frac{2 \cdot S \cdot P}{h1 \cdot De^2 + h2 \cdot (P - De) \cdot De}};$   
>  $Q := \sqrt{\frac{2 \cdot S \cdot P \cdot De}{h1 \cdot De + h2 \cdot (P - De)}};$   
>  $Ch1 := \frac{h1 \cdot De^2 T}{2 \cdot P};$   
>  $Ch2 := \frac{h2 \cdot (P - De) De \cdot T}{2 \cdot P};$   
>  $TC := \frac{S}{T} + C \cdot De + Ch1 + Ch2;$   
>  $S := 1000 : P := 2000 : De := 1500 : C := 20 : h1 := 2 : h2 := 1.5 ;$   
>  $\text{printf}("T= \% .3f, Q= \% .3f, Ch1= \% .3f, Ch2= \% .3f, TC= \% .3f \backslash n", T, Q, Ch1,$   
     $Ch2, TC);$ 
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T=0.843,    Q=1264.911,    Ch1=948.683,    Ch2=237.171,  
TC=32371.708
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Lampiran 2. Perhitungan Kasus II dengan *Software Maple*

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> restart;
> addList := proc(x :: integer, n :: integer, h :: float) :: float;
    local α, i, T, Q, S, P, De, Ch1, C, Ch2, TC, h1, h2;
    description "add a list of numbers and multiply by a constant";
    α := x;
    h1 := 2; h2 := 1.5; De := 1500; S := 1000; P := 2000; C := 20;
    for i from 1 by 1 to n do
        α := α + h;
        T := sqrt( $\frac{2 \cdot S \cdot P \cdot \alpha}{h1 \cdot De^2 + h2 \cdot \alpha \cdot (P - De) \cdot De}$ );
        Q := sqrt( $\frac{2 \cdot S \cdot P \cdot De \cdot \alpha}{h1 \cdot De + h2 \cdot \alpha \cdot (P - De)}$ );
        Ch1 :=  $\frac{h1 \cdot De^2 \cdot T}{2 \cdot \alpha \cdot P}$ ;
        Ch2 :=  $\frac{h2 \cdot (P - De) \cdot De \cdot T}{2 \cdot P}$ ;
        TC :=  $\frac{S}{T} + \frac{C \cdot De}{\alpha} + Ch1 + Ch2$ ;
        printf("a%d=%g,T=%.3f, Q=%.3f, Ch1=%.3f, Ch2=%.3f, TC=
        %.3f\n", i, α, T, Q, Ch1, Ch2, TC) ;
    end do;
end proc;

> addList(0, 20, 0.05)
a1=0.05, T=0.210, Q=314.270, Ch1=4714.045,
Ch2=58.926, TC=609545.942
a2=0.1, T=0.294, Q=441.726, Ch1=3312.946,
Ch2=82.824, TC=306791.539
a3=0.15, T=0.358, Q=537.733, Ch1=2688.664,
Ch2=100.825, TC=205578.978
a4=0.2, T=0.411, Q=617.213, Ch1=2314.550,
Ch2=115.728, TC=154860.556
a5=0.25, T=0.457, Q=685.994, Ch1=2057.983,
Ch2=128.624, TC=124373.214
a6=0.3, T=0.498, Q=747.087, Ch1=1867.718,
Ch2=140.079, TC=104015.595

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a7=0.35, T=0.535, Q=802.296, Ch1=1719.205,
Ch2=150.430, TC=89453.556
a8=0.4, T=0.569, Q=852.803, Ch1=1599.005,
Ch2=159.901, TC=78517.812
a9=0.45, T=0.600, Q=899.438, Ch1=1499.063,
Ch2=168.645, TC=70002.083
a10=0.5, T=0.629, Q=942.809, Ch1=1414.214,
Ch2=176.777, TC=63181.981
a11=0.55, T=0.656, Q=983.378, Ch1=1340.970,
Ch2=184.383, TC=57596.162
a12=0.6, T=0.681, Q=1021.508, Ch1=1276.885,
Ch2=191.533, TC=52936.835
a13=0.65, T=0.705, Q=1057.487, Ch1=1220.178,
Ch2=198.279, TC=48990.759
a14=0.7, T=0.728, Q=1091.554, Ch1=1169.522,
Ch2=204.666, TC=45605.519
a15=0.75, T=0.749, Q=1123.903, Ch1=1123.903,
Ch2=210.732, TC=42669.270
a16=0.8, T=0.770, Q=1154.701, Ch1=1082.532,
Ch2=216.506, TC=40098.076
a17=0.85, T=0.789, Q=1184.087, Ch1=1044.783,
Ch2=222.016, TC=37827.715
a18=0.9, T=0.808, Q=1212.183, Ch1=1010.153,
Ch2=227.284, TC=35808.207
a19=0.95, T=0.826, Q=1239.094, Ch1=978.232,
Ch2=232.330, TC=34000.072
a20=1, T=0.843, Q=1264.911, Ch1=948.683,
Ch2=237.171, TC=32371.708

Lampiran 3. Perhitungan Kasus III dengan *Software Maple*

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> restart;
> addList := proc(y :: float, n :: integer, h :: float) :: float;
    local β, i, T, Q, S, P, De, d, b, x, Ch1, C, Ch2, TC, h1, h2;
    description "add a list of numbers and multiply by a constant";
    β := -0.05;
    h1 := 2; h2 := 1.5; De := 1500; S := 1000; P := 2000; C := 20; d := 10; b
        := 30; x := 1800;
    for i from 1 by 1 to n do
        β := β + h;
        T := sqrt( S / ( ( (h1·De2 / (2·(1-β)2·P) + h2·( (P-De)·De2 / (2·(1-β)2·P2 + De2 / (2·(1-β)2 )
            · (2 - De/x - De/P) · (1/x - 1/P) + De/2 · (1 - De/((1-β)x)2) ) ) ) );
        Q := sqrt( (S·De) / ( (h1·De / (2·(1-β)2·P) + h2·( (P-De)·De / (2·(1-β)2·P2
            + De / (2·(1-β)2 · (2 - De/x - De/P) · (1/x - 1/P) + 1/2 · (1 - De/((1-β)x)2) ) ) ) );
        Ch1 := (h1·De2·T) / (2·(1-β)2·P);
        Ch2 := h2·( (P-De)·De2·T / (2·(1-β)2·P2 + De2·T / (2·(1-β)2 · (2 - De/x - De/P) · (1/x
            - 1/P) + De·T / (2 · (1 - De/((1-β)x)2) ) );
        TC := S/T + C·De / (1-β) + d·De / (1-β) + Ch1 - β·b·De / (1-β) + Ch2;
        printf("B%d=%g,T=%0.3f,Q=%0.3f,Ch1=%0.3f,Ch2=%0.3f,TC=
            %0.3f\n", i, β, T, Q, Ch1, Ch2, TC);
    end do;
    end proc;
> addList(-0.05, 20, 0.05)

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B1=0, T=0.843, Q=1264.911, Ch1=948.683,
 Ch2=237.171, TC=47371.708
 B2=0.05, T=0.806, Q=1208.533, Ch1=1004.321,
 Ch2=236.852, TC=47482.348
 B3=0.1, T=0.766, Q=1149.196, Ch1=1064.071,
 Ch2=241.189, TC=47610.520
 B4=0.15, T=0.725, Q=1087.200, Ch1=1128.581,
 Ch2=251.109, TC=47759.382
 B5=0.2, T=0.682, Q=1022.899, Ch1=1198.709,
 Ch2=267.712, TC=47932.842
 B6=0.25, T=0.638, Q=956.689, Ch1=1275.586,
 Ch2=292.322, TC=48135.815
 B7=0.3, T=0.593, Q=889.001, Ch1=1360.716,
 Ch2=326.572, TC=48374.575
 B8=0.35, T=0.547, Q=820.280, Ch1=1456.119,
 Ch2=372.524, TC=48657.286
 B9=0.4, T=0.501, Q=750.978, Ch1=1564.538,
 Ch2=432.856, TC=48994.788
 B10=0.45, T=0.454, Q=681.536, Ch1=1689.759,
 Ch2=511.152, TC=49401.822
 B11=0.5, T=0.408, Q=612.372, Ch1=1837.117,
 Ch2=612.372, TC=49898.979
 B12=0.55, T=0.363, Q=543.875, Ch1=2014.353,
 Ch2=743.632, TC=50515.970
 B13=0.6, T=0.318, Q=476.393, Ch1=2233.093,
 Ch2=915.568, TC=51297.321
 B14=0.65, T=0.273, Q=410.230, Ch1=2511.611,
 Ch2=1144.876, TC=52312.974
 B15=0.7, T=0.230, Q=345.643, Ch1=2880.358,
 Ch2=1459.381, TC=53679.478
 B16=0.75, T=0.189, Q=282.843, Ch1=3394.113,
 Ch2=1909.188, TC=55606.602
 B17=0.8, T=0.148, Q=221.994, Ch1=4162.387,
 Ch2=2594.554, TC=58513.882
 B18=0.85, T=0.109, Q=163.219, Ch1=5440.624,
 Ch2=3749.497, TC=63380.243
 B19=0.9, T=0.071, Q=106.600, Ch1=7995.027,
 Ch2=6076.220, TC=73142.495

$B20=0.95$, $T=0.035$, $Q=52.188$, $Ch1=15656.318$,
 $Ch2=13086.072$, $TC=102484.781$

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