

```

[> restart;
[> alpha := 1.5
[                                      $\alpha := 1.5$  (1)
[
[> delta1 := 1
[                                      $\delta l := 1$  (2)
[
[> eta := 1
[                                      $\eta := 1$  (3)
[
[> delta21 := 1
[                                      $\delta l := 1$  (4)
[
[> delta22 := 1
[                                      $\delta 2 := 1$  (5)
[
[> delta23 := 1
[                                      $\delta 3 := 1$  (6)
[
[> t := 4.5 :
[> f := exp( alpha·y2 + delta1· z1 + eta· v2 ) :
[> y2 := delta21·z1 + delta22·z2 + delta23· z3 + v2 :
[> g11_11 := f·z1·z1 :
[> g11_12 := f·z1·y2 :
[> g11_13 := f·z1·v2 :
[> g11_22 := f·y2·y2 :
[> g11_23 := f·y2·v2 :
[> g11_33 := f·v2·v2 :
[> ff1 :=  $\frac{1}{\sqrt{2 \cdot \pi}} \exp\left(-\frac{1}{2} z1 \cdot z1\right) :$ 
[> ff2 :=  $\frac{1}{\sqrt{2 \cdot \pi}} \exp\left(-\frac{1}{2} z2 \cdot z2\right) :$ 
[> ff3 :=  $\frac{2^9}{8!} \cdot (z3 + t)^8 \cdot \exp(-2 \cdot (z3 + t)) :$ 
[> vd :=  $\frac{1}{\sqrt{2 \cdot \pi}} \exp\left(-\frac{1}{2} v2 \cdot v2\right) :$ 
[> a11_11 := g11_11 ·ff1·ff2·ff3·vd :
[> A11_11 := int(a11_11, z1=-∞..∞, z2=-∞..∞, z3=-t..∞, v2=-∞..∞) :
[> A11_12 := int(g11_12 ·ff1·ff2·ff3·vd, z1=-∞..∞, z2=-∞..∞, z3=-t..∞, v2=-∞..∞) :
[> A11_13 := int(g11_13 ·ff1·ff2·ff3·vd, z1=-∞..∞, z2=-∞..∞, z3=-t..∞, v2=-∞..∞) :
[> A11_22 := int(g11_22 ·ff1·ff2·ff3·vd, z1=-∞..∞, z2=-∞..∞, z3=-t..∞, v2=-∞..∞) :
[> A11_23 := int(g11_23 ·ff1·ff2·ff3·vd, z1=-∞..∞, z2=-∞..∞, z3=-t..∞, v2=-∞..∞) :
[> A11_33 := int(g11_33 ·ff1·ff2·ff3·vd, z1=-∞..∞, z2=-∞..∞, z3=-t..∞, v2=-∞..∞) :
[> g12_11 := f·z1·z1 :
[> g12_12 := f·z1·z2 :
[> g12_13 := f·z1·z3 :

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> g12_21 := f·y2·z1 :
> g12_22 := f·y2·z2 :
> g12_23 := f·y2·z3 :
> g12_31 := f·v2·z1 :
> g12_32 := f·v2·z2 :
> g12_33 := f·v2·z3 :
> A12_11 := - eta·int(g12_11 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3 =
    - t..infinity, v2=-infinity..infinity) :
> A12_12 := - eta·int(g12_12 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3 =
    - t..infinity, v2=-infinity..infinity) :
> A12_13 := - eta·int(g12_13 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3 =
    - t..infinity, v2=-infinity..infinity) :
> A12_21 := - eta·int(g12_21 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3 =
    - t..infinity, v2=-infinity..infinity) :
> A12_22 := - eta·int(g12_22 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3 =
    - t..infinity, v2=-infinity..infinity) :
> A12_23 := - eta·int(g12_23 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3 =
    - t..infinity, v2=-infinity..infinity) :
> A12_31 := - eta·int(g12_31 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3 =
    - t..infinity, v2=-infinity..infinity) :
> A12_32 := - eta·int(g12_32 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3 =
    - t..infinity, v2=-infinity..infinity) :
> A12_33 := - eta·int(g12_33 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3 =
    - t..infinity, v2=-infinity..infinity) :
> g22_11 := f·z1·z1 :
> g22_12 := f·z1·z2 :
> g22_13 := f·z1·z3 :
> g22_22 := f·z2·z2 :
> g22_23 := f·z2·z3 :
> g22_33 := f·z3·z3 :
> A22_11 := eta·eta·int(g22_11 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3
    =- t..infinity, v2=-infinity..infinity) :
> A22_12 := eta·eta·int(g22_12 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3
    =- t..infinity, v2=-infinity..infinity) :
> A22_13 := eta·eta·int(g22_13 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3
    =- t..infinity, v2=-infinity..infinity) :
> A22_22 := eta·eta·int(g22_22 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3
    =- t..infinity, v2=-infinity..infinity) :
> A22_23 := eta·eta·int(g22_23 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3
    =- t..infinity, v2=-infinity..infinity) :
> A22_33 := eta·eta·int(g22_33 ·ff1·ff2·ff3·vd, z1=-infinity..infinity, z2=-infinity..infinity, z3
    =- t..infinity, v2=-infinity..infinity) :
> C22_11 := int(z1·z1·ff1, z1=-infinity..infinity) :
> C22_22 := int(z2·z2·ff2, z2=-infinity..infinity) :

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$$\begin{aligned}
& \text{> } C22_33 := 2.25 : \\
& \text{> } AJ1 := \begin{bmatrix} A11_11 & A11_12 & A11_13 & A12_11 & A12_12 & A12_13 \\ A11_12 & A11_22 & A11_23 & A12_21 & A12_22 & A12_23 \\ A11_13 & A11_23 & A11_33 & A12_31 & A12_32 & A12_33 \\ A12_11 & A12_21 & A12_31 & A22_11 & A22_12 & A22_13 \\ A12_12 & A12_22 & A12_32 & A22_12 & A22_22 & A22_23 \\ A12_13 & A12_23 & A12_33 & A22_13 & A22_23 & A22_33 \end{bmatrix} : \\
& \text{> } AJ2 := \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & C22_11 & 0 & 0 \\ 0 & 0 & 0 & 0 & C22_22 & 0 \\ 0 & 0 & 0 & 0 & 0 & C22_33 \end{bmatrix} : \\
& \text{> } ATS := \begin{bmatrix} A11_11 & A11_12 & A11_13 & A12_11 & A12_12 & A12_13 \\ A11_12 & A11_22 & A11_23 & A12_21 & A12_22 & A12_23 \\ A11_13 & A11_23 & A11_33 & A12_31 & A12_32 & A12_33 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \\
& + \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & C22_11 & 0 & 0 \\ 0 & 0 & 0 & 0 & C22_22 & 0 \\ 0 & 0 & 0 & 0 & 0 & C22_33 \end{bmatrix} : \\
& \text{> } BTS1 := \begin{bmatrix} A11_11 & A11_12 & A11_13 & 0 & 0 & 0 \\ A11_12 & A11_22 & A11_23 & 0 & 0 & 0 \\ A11_13 & A11_23 & A11_33 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} :
\end{aligned}$$

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> BTS2 := 
$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & C22_{11} & 0 & 0 \\ 0 & 0 & 0 & 0 & C22_{22} & 0 \\ 0 & 0 & 0 & 0 & 0 & C22_{33} \end{bmatrix} :$$

=
> AJ := AJ1 + AJ2 :
=
> AVJ := (AJ)-1.(tauI·AJ1 + AJ2).(AJ)-1 :
=
> ATStr := (ATS)+ :
=
> AVTS := (ATS)-1.(tauI·BTS1 + BTS2).(ATStr)-1 :
=
> ARE :=  $\frac{AVTS[2,2]}{AVJ[2,2]} :$ 
=
> evalf[100](ARE)
(
3.80470864801103752058009633145098767085254829148017853386612708409724631068\
5604812718302613728225667 × 10-8 τI
+ 0.403842444350140812468654758689865360132710929362293121407353111376875892\
1337911346012885305350873809)/
(
1.69474372789255295533103273256489865687327032165980940597431088203736848067\
5227684334295450073058347 × 10-7 τI
+ 0.307692307692487340297891047637053973557548138816828347203607198513090108\
2832632354221429689105381114)
=
> tauI := 1
τI := 1 (8)
=
> evalf[100](ARE)
1.312487344883071301658515396848893539264867079356462168955832968416799704891488\
501497278434006097689 (9)
=
> tauI :=  $\frac{1}{10}$ 
τI :=  $\frac{1}{10}$  (10)
=
> evalf[100](ARE)
1.31248788421174962733270996987542390608305446132090067624847530587294523983211\
5479665593951414370604 (11)

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> tauI := 105
                                      $\tau I := 100000$  (26)
=
> evalf[100](ARE)
1.25569083672748833438560459868173076485531071693861172715753353337217148362737\ (27)
6327215308320835233153
=
> tauI := 106
                                      $\tau I := 1000000$  (28)
=
> evalf[100](ARE)
0.92606954530883003807929237177416169610809495382388394344681550327548166347856\ (29)
20502379493186713589986
=
> tauI := 107
                                      $\tau I := 10000000$  (30)
=
> evalf[100](ARE)
0.39167958187593054684223994603130396539615393744111354738052611924318590050163\ (31)
1188344387705767798525
=
> tauI := 108
                                      $\tau I := 100000000$  (32)
=
> evalf[100](ARE)
0.24390144804389434376642630669923530844888324943524436129275691008503326788347\ (33)
21715097071280394601202
=
> tauI := 109
                                      $\tau I := 1000000000$  (34)
=
> evalf[100](ARE)
0.22647226550404209063740911018744083154671991401076025030634815202123614364467\ (35)
27142904065775464436973
=
> tauI := 1020
                                      $\tau I := 100000000000000000000$  (36)
=
> evalf[100](ARE)
0.22450052980827974897709856541727804055861308397310439987722122919088264712862\ (37)
42076486815021894895835
=
> restart;
>

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