

```

> restart;
> alpha := 0.1
<math display="block">\alpha := 0.1 \tag{1}>
> delta1 := 1
<math display="block">\delta l := 1 \tag{2}>
> eta := 1
<math display="block">\eta := 1 \tag{3}>
> delta21 := 1
<math display="block">\delta l := 1 \tag{4}>
> delta22 := 1
<math display="block">\delta 2 := 1 \tag{5}>
> delta23 := 1
<math display="block">\delta 3 := 1 \tag{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)
(
0.30834837036019065227094165601190187307818421219642188135088097849717290218\
63770389357972699948004114
+ 0.083169472612539197084702033537192939084840311055445833589939996162787214\
26616347449032634069241631129  $\tau I$ ) /
(
0.08328259265041834419224873909530970089023076043271899797518018906860665465\
277091523014413641224735481  $\tau I$ 
+ 0.307724487704224665942011949273081547871269328621850165136666669825221304\
6039657585746609814262202390)
=
> tauI := 1

$$\tau I := 1$$
 (8)
=
> evalf[100](ARE)
1.001306274601532990309621527967725258317317111320156060357060848938721694548771\
226618374954330377678 (9)
=
> tauI :=  $\frac{1}{10}$ 

$$\tau I := \frac{1}{10}$$
 (10)
=
> evalf[100](ARE)
1.00193819119767890837743218502276276457582762393718243846360497939814088613221\
9510661056815636232824 (11)

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> tauI := 105
                                      $\tau I := 100000$  (26)
=
> evalf[100](ARE)
0.99864185760653914146153027524947618318456175800608089885266099978216035921517\ (27)
57500238652595353764644
=
> tauI := 106
                                      $\tau I := 1000000$  (28)
=
> evalf[100](ARE)
0.99864174502224018213695921996877489512940838717414484193697835040211296909772\ (29)
61419777843965557339187
=
> tauI := 107
                                      $\tau I := 10000000$  (30)
=
> evalf[100](ARE)
0.99864173376339845364143023561802833818175411659679042099352813165893801651880\ (31)
18283386993981941375871
=
> tauI := 108
                                      $\tau I := 100000000$  (32)
=
> evalf[100](ARE)
0.99864173263751016231422898203199823199923153535966937836360648797702525859011\ (33)
15403279010806830501855
=
> tauI := 109
                                      $\tau I := 1000000000$  (34)
=
> evalf[100](ARE)
0.99864173252492129199658034986911863863724993557868797190082521030466488845116\ (35)
36662055551451449762010
=
> tauI := 1020
                                      $\tau I := 100000000000000000000$  (36)
=
> evalf[100](ARE)
0.99864173251241141705473389774564669199682521376615763286980044360410430000267\ (37)
71767927823521788927038
=
> restart;
>

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