

```

> restart;
> alpha := 1
α := 1 (1)
> delta1 := 1
δ1 := 1 (2)
> eta := 1
η := 1 (3)
> delta21 := 1
δ21 := 1 (4)
> delta22 := 1
δ22 := 1 (5)
> delta23 := 1
δ23 := 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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[
>  $BTS2 := \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & C22_{11} & 0 & 0 \\ 0 & 0 & 0 & 0 & C22_{22} & 0 \\ 0 & 0 & 0 & 0 & 0 & C22_{33} \end{bmatrix} :$ 
=
>  $AJ := AJ1 + AJ2 :$ 
=
>  $AVJ := (AJ)^{-1} \cdot (\tau l \cdot AJ1 + AJ2) \cdot (AJ)^{-1} :$ 
=
>  $ATStr := (ATS)^+ :$ 
=
>
=
>  $AVTS := (ATS)^{-1} \cdot (\tau l \cdot BTS1 + BTS2) \cdot (ATStr)^{-1} :$ 
=
>  $ARE := \frac{AVTS[2,2]}{AVJ[2,2]} :$ 
=
>  $evalf[100](ARE)$ 
(
(7)
0.35826262853289880316907343934370961397988425015452042479069506096533123560\
15058717761420464123166826
+ 0.000146179833679833679833679833679833679833679833679833679833679833\
6798336798336798336798336798337  $\tau l$ ) /
(
0.00022054188015148139897527288928491869013143239028736912452662062820227222\
09846290933392737803519714859  $\tau l$ 
+ 0.307692417362098805627431156502219099679558579090768888051133540106585328\
2382576211936871326490395325)
=
>  $\tau l := 1$ 
(8)
<math display="block">\tau l := 1
=
>  $evalf[100](ARE)$ 
1.163993906747525942363246881691906886406280261313437495742975485577627578521640\
379446753487404486626 (9)
=
>  $\tau l := \frac{1}{10}$ 
(10)
<math display="block">\tau l := \frac{1}{10}
=
>  $evalf[100](ARE)$ 
1.16431718245632867183802227053985794162926686046111867573666856707026773347205\
1689912516930129936505 (11)

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$$\tau l := \frac{1}{100} \quad (12)$$

$$\text{evalf}[100](ARE) \\ 1.16434953296647049653840289291688932450584539066460299745801936756563465510144 \backslash (13) \\ 5654930554223428735206$$

$$\tau l := 10^{-20} \quad (14)$$

$$\text{evalf}[100](ARE) \\ 1.16435312772523713605590796357740162160956486322939415513068392686588343668456 \backslash (15) \\ 7448064181627974288498$$

$$\tau l := 10^{-30} \quad (16)$$

$$\text{evalf}[100](ARE) \\ 1.16435312772523713605591155836193372532027489326714154041367483476097613040217 \backslash (17) \\ 6243099737357646813557$$

$$\tau l := 10 \quad (18)$$

$$\text{evalf}[100](ARE) \\ 1.16078392583476149303649922986917575538600080477704527220594329795901559525109 \backslash (19) \\ 4395248377914745134802$$

$$\tau l := 10^2 \quad (20)$$

$$\text{evalf}[100](ARE) \\ 1.13080955442827901374127541782975905546884083679404461101728200055718587024593 \backslash (21) \\ 4755195318902141861276$$

$$\tau l := 10^3 \quad (22)$$

$$\text{evalf}[100](ARE) \\ 0.95495969229405051078506459340897583926097800756296389732571165295885629725629 \backslash (23) \\ 42199831512457760399380$$

$$\tau l := 10^4 \quad (24)$$

$$\text{evalf}[100](ARE) \\ 0.72422619089043133146549753455462804156241572661051369584611423237055208200053 \backslash (25) \\ 89688830121249525655791$$

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> tauI := 105
                                      $\tau I := 100000$  (26)
=
> evalf[100](ARE)
0.66972212116577820363686853941087836551222293908046392842449090788054491571442\ (27)
61289788487849785746372
=
> tauI := 106
                                      $\tau I := 1000000$  (28)
=
> evalf[100](ARE)
0.66351994529075914220137975629763215442907608049182931452219787029307198867657\ (29)
76094224457724494762115
=
> tauI := 107
                                      $\tau I := 10000000$  (30)
=
> evalf[100](ARE)
0.66289116236721848462858871376855517914065313418963528035533603343487533385828\ (31)
32668015503247669296097
=
> tauI := 108
                                      $\tau I := 100000000$  (32)
=
> evalf[100](ARE)
0.66282819722770957908682389884977891047187120719274161779955160697816063247324\ (33)
53726530838414576124735
=
> tauI := 109
                                      $\tau I := 1000000000$  (34)
=
> evalf[100](ARE)
0.66282189984407669196324658750722562959189877221794971304793091756492307336895\ (35)
31216517584463616696692
=
> tauI := 1020
                                      $\tau I := 100000000000000000000$  (36)
=
> evalf[100](ARE)
0.66282120012502205345963262483997701651453006277958111565545741276397522788656\ (37)
59851939394238649638346
=
> restart;
>

```