

> restart;

Lineares Gleichungssystem mit 4 Gleichungen

> with(codegen, fortran) :

> Solve({-2*ca/a^3*za+cc*c3=2*sigma/a-pt, 1/rho^3*za+c3-
1/rho^3*as-cs3=0, 2*ca/rho^3*za-cc*c3-
2*cas/rho^3*as+ccs*cs3=2*sigro/rho+pt, -2*cas/R^3*as+ccs*cs3=-
2*sigR/R}, {za, c3, as, cs3});

$$\text{Solve}\left(\left\{-\frac{2caza}{a^3}+cc\,c3=\frac{2\sigma}{a}-pt,\frac{za}{\rho^3}+c3-\frac{as}{\rho^3}-cs3=0,\right.\right. \\ \left.\left.\frac{2caza}{\rho^3}-cc\,c3-\frac{2casas}{\rho^3}+ccs\,cs3=\frac{2\sigma}{\rho}+pt,-\frac{2casas}{R^3}+ccs\,cs3=-\frac{2\sigma R}{R}\right\},\right. \\ \left.\{za, c3, as, cs3\}\right)$$

> solve({-2*ca/a^3*za+cc*c3=2*sigma/a-pt, 1/rho^3*za+c3-
1/rho^3*as-cs3=0, 2*ca/rho^3*za-cc*c3-
2*cas/rho^3*as+ccs*cs3=2*sigro/rho+pt, -2*cas/R^3*as+ccs*cs3=-
2*sigR/R}, {za, c3, as, cs3});

$$\{cs3=-2(-2ca\rho^5cas\sigma-roca\rho^6caspt-cc\rho^3casigR^2-cc\rho^3cas\sigma a^2 \\ -2ca\rho^3cas\sigma R^2+cca^3casigR^2-cca^3cas\sigma\rho^2+ca\rho^3caspta^3 \\ -2ca\rho^3cas\sigma a^2-cca^3casigR^2)/(2ca\rho^6casccs-2ca\rho^3casccsR^3 \\ +2cca^3casca\rho^3+cca^3casccs\rho^3+cca^3casccsR^3-cca^3casccsR^3 \\ -2cc\rho^6casca-cc\rho^3casccsR^3),c3=-\left(a^3casptccs\rho^3+a^3pta^3ccsR^3 \\ -a^3caspta^3ccsR^3+2ca\rho^3caspta^3-4ca\rho^3cas\sigma a^2-2a^2cas\sigma cc\rho^3 \\ -2a^2\sigma ca^3ccsR^3+2a^2cas\sigma cc\rho^3-4ca\rho^3cas\sigma R^2-4ca\rho^5cas\sigma \\ -2ca\rho^6caspt-pt\rho^3casccsR^3-2ca^3cas\sigma\rho^2-2casigR^2cc\rho^3\right)/(\\ 2ca\rho^6casccs-2ca\rho^3casccsR^3+2cca^3casca\rho^3+cca^3casccs\rho^3 \\ +cca^3casccsR^3-cca^3casccsR^3-2cc\rho^6casca-cc\rho^3casccsR^3),as=R^2\rho^2(\\ 2ccsRca\rho^3\sigma+ccsRca\rho^4pt+ccsRcc\rho\sigma a^2+ccsRcc\rho^3\sigma \\ -ccsRca\rho^3pta^3+2ccsRca\rho\sigma a^2+2\sigma Rca\rho^4ccs+2\sigma Rcc\rho^3ca\rho \\ +\sigma Rcc\rho^3ccs\rho-2\sigma Rcc\rho^4ca)/(2ca\rho^6casccs-2ca\rho^3casccsR^3 \\ +2cca^3casca\rho^3+cca^3casccs\rho^3+cca^3casccsR^3-cca^3casccsR^3 \\ -2cc\rho^6casca-cc\rho^3casccsR^3),za=\rho^2a^2(a^3casptccs\rho^4-2cas\sigma cc\rho^4 \\ -\rho a^3caspta^3ccsR^3+2\rho cas\sigma cc\rho^3+R^3ccscc\rho\sigma+R^3ccsccas\sigma \\ +R^2\sigma Rccasccs\rho+2cc\rho^4cas\sigma+2cca^3cas\sigma\rho^3+2\rho ccas\sigma R^2)/(\\ 2ca\rho^6casccs-2ca\rho^3casccsR^3+2cca^3casca\rho^3+cca^3casccs\rho^3 \\ +cca^3casccsR^3-cca^3casccsR^3-2cc\rho^6casca-cc\rho^3casccsR^3)\}$$

> cs3:=-

2*(2*ca*rho^5*cas*sigro+ca*rho^6*cas*pt+cc*rho^3*ca*sigR*R^2+cc*rho^3*cas*sigma*a^2+2*ca*rho^3*cas*sigR*R^2-

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cc*a^3*ca*sigR*R^2+cc*a^3*cas*sigro*rho^2-
ca*rho^3*cas*pt*a^3+2*ca*rho^3*cas*sig*a^2+cc*a^3*cas*sigR*R^2) /
(-2*ca*rho^6*cas*ccs+2*ca*rho^3*cas*ccs*R^3-
2*cc*a^3*cas*ca*rho^3-cc*a^3*cas*ccs*rho^3-
cc*a^3*ca*ccs*R^3+cc*a^3*cas*ccs*R^3+2*cc*rho^6*cas*ca+cc*rho^3*c
a*ccs*R^3);
```

$$cs3 := -2 (2 ca \rho^5 cas sigro + ca \rho^6 cas pt + cc \rho^3 ca sigR R^2 + cc \rho^3 cas sig a^2 + 2 ca \rho^3 cas sigR R^2 - cc a^3 ca sigR R^2 + cc a^3 cas sigro \rho^2 - ca \rho^3 cas pt a^3 + 2 ca \rho^3 cas sig a^2 + cc a^3 cas sigR R^2) / (-2 ca \rho^6 cas ccs + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3)$$

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> c3:=-
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```
(2*ca*rho^6*cas*pt+4*ca*rho^5*cas*sigro+4*ca*rho^3*cas*sigR*R^2+r
ho^3*ca*ccs*R^3*pt-
2*ca*rho^3*cas*pt*a^3+4*ca*rho^3*cas*sig*a^2+2*rho^3*ca*sigR*R^2
*ccs+2*rho^3*cas*sig*a^2*ccs-
rho^3*cas*pt*a^3*ccs+2*ccs*R^3*sigro*ca*rho^2-
ca*ccs*R^3*pt*a^3+2*ca*ccs*R^3*sig*a^2+ccs*R^3*cas*pt*a^3-
2*ccs*R^3*cas*sig*a^2) / (-
2*ca*rho^6*cas*ccs+2*ca*rho^3*cas*ccs*R^3-2*cc*a^3*cas*ca*rho^3-
cc*a^3*cas*ccs*rho^3-
cc*a^3*ca*ccs*R^3+cc*a^3*cas*ccs*R^3+2*cc*rho^6*cas*ca+cc*rho^3*c
a*ccs*R^3);
```

$$c3 := -(2 ca \rho^6 cas pt + 4 ca \rho^5 cas sigro + 4 ca \rho^3 cas sigR R^2 + pt \rho^3 ca ccs R^3 - 2 ca \rho^3 cas pt a^3 + 4 ca \rho^3 cas sig a^2 + 2 ca sigR R^2 ccs \rho^3 + 2 a^2 cas sig a ccs \rho^3 - a^3 cas pt ccs \rho^3 + 2 ca ccs R^3 sigro \rho^2 - a^3 pt ca ccs R^3 + 2 a^2 sig a ca ccs R^3 + a^3 cas pt ccs R^3 - 2 a^2 cas sig a ccs R^3) / (-2 ca \rho^6 cas ccs + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3)$$

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> as:=-
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```
R^2*rho^2*(2*ccs*R*ca*rho^3*sigro+ccs*R*ca*rho^4*pt+ccs*R*cc*rho*
sig*a^2+ccs*R*cc*a^3*sigro-
ccs*R*ca*rho*pt*a^3+2*ccs*R*ca*rho*sig*a^2+2*sigR*ca*rho^4*ccs+2
*sigR*cc*a^3*ca*rho+sigR*cc*a^3*ccs*rho-2*sigR*cc*rho^4*ca) / (-
2*ca*rho^6*cas*ccs+2*ca*rho^3*cas*ccs*R^3-2*cc*a^3*cas*ca*rho^3-
cc*a^3*cas*ccs*rho^3-
cc*a^3*ca*ccs*R^3+cc*a^3*cas*ccs*R^3+2*cc*rho^6*cas*ca+cc*rho^3*c
a*ccs*R^3);
```

$$as := -R^2 \rho^2 (2 ccs R ca \rho^3 sigro + ccs R ca \rho^4 pt + ccs R cc \rho sig a^2 + ccs R cc a^3 sigro - ccs R ca \rho pt a^3 + 2 ccs R ca \rho sig a^2 + 2 sigR ca \rho^4 ccs + 2 sigR cc a^3 ca \rho + sigR cc a^3 ccs \rho - 2 sigR cc \rho^4 ca) / (-2 ca \rho^6 cas ccs + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 + cc a^3 cas ccs R^3)$$

$$+ 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3)$$

```
> za := rho^2*a^2*(2*rho^4*cas*siga*ccs-
rho^4*cas*pt*a*ccs+rho*ccs*R^3*cas*pt*a-2*rho*ccs*R^3*cas*siga-
R^3*ccs*cc*rho*siga-R^3*ccs*cc*a*sigro-R^2*sigR*cc*a*ccs*rho-
2*cc*rho^4*cas*siga-2*cc*a*cas*sigro*rho^3-
2*rho*cc*a*cas*sigR*R^2)/(-
2*ca*rho^6*cas*ccs+2*ca*rho^3*cas*ccs*R^3-2*cc*a^3*cas*ca*rho^3-
cc*a^3*cas*ccs*rho^3-
cc*a^3*ca*ccs*R^3+cc*a^3*cas*ccs*R^3+2*cc*rho^6*cas*ca+cc*rho^3*c
a*ccs*R^3);
```

$$za := \rho^2 a^2 (2 cas siga ccs \rho^4 - a cas pt ccs \rho^4 + \rho a cas pt ccs R^3 - 2 \rho cas siga ccs R^3 - R^3 ccs cc \rho siga - R^3 ccs cc a sigro - R^2 sigR cc a ccs \rho - 2 cc \rho^4 cas siga - 2 cc a cas sigro \rho^3 - 2 \rho cc a cas sigR R^2) / (-2 ca \rho^6 cas ccs + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3)$$

```
> fortran (c3) ;
```

```
t0 = -(2*ca*rho**6*cas*pt+4*ca*rho**5*cas*sigro+4*ca*rho**3*cas*si
#gR*R**2+pt*rho**3*ca*ccs*R**3-2*ca*rho**3*cas*pt*a**3+4*ca*rho**3*
#cas*siga*a**2+2*ca*sigR*R**2*ccs*rho**3+2*a**2*cas*siga*ccs*rho**3
#-a**3*cas*pt*ccs*rho**3+2*ca*ccs*R**3*sigro*rho**2-a**3*pt*ca*ccs*
#R**3+2*a**2*siga*ca*ccs*R**3+a**3*cas*pt*ccs*R**3-2*a**2*cas*siga*
#ccs*R**3)/(-2*ca*rho**6*cas*ccs+2*ca*rho**3*cas*ccs*R**3-2*cc*a**3
#cas*ca*rho**3-cc*a**3*cas*ccs*rho**3-cc*a**3*ca*ccs*R**3+cc*a**3*
#cas*ccs*R**3+2*cc*rho**6*cas*ca+cc*rho**3*ca*ccs*R**3)
```

```
> fortran (cs3) ;
```

```
t0 = -2*(2*ca*rho**5*cas*sigro+ca*rho**6*cas*pt+cc*rho**3*ca*sigR*
#R**2+cc*rho**3*cas*siga*a**2+2*ca*rho**3*cas*sigR*R**2-cc*a**3*ca*
#sigR*R**2+cc*a**3*cas*sigro*rho**2-ca*rho**3*cas*pt*a**3+2*ca*rho*
#*3*cas*siga*a**2+cc*a**3*cas*sigR*R**2)/(-2*ca*rho**6*cas*ccs+2*ca
#*rho**3*cas*ccs*R**3-2*cc*a**3*cas*ca*rho**3-cc*a**3*cas*ccs*rho**
#3-cc*a**3*ca*ccs*R**3+cc*a**3*cas*ccs*R**3+2*cc*rho**6*cas*ca+cc*r
#ho**3*ca*ccs*R**3)
```

```
> fortran (as) ;
```

```
t0 = -R**2*rho**2*(2*ccs*R*ca*rho**3*sigro+ccs*R*ca*rho**4*pt+ccs*
#R*cc*rho*siga*a**2+ccs*R*cc*a**3*sigro-ccs*R*ca*rho*pt*a**3+2*ccs*
#R*ca*rho*siga*a**2+2*sigR*ca*rho**4*ccs+2*sigR*cc*a**3*ca*rho+sigR
#*cc*a**3*ccs*rho-2*sigR*cc*rho**4*ca)/(-2*ca*rho**6*cas*ccs+2*ca*r
#ho**3*cas*ccs*R**3-2*cc*a**3*cas*ca*rho**3-cc*a**3*cas*ccs*rho**3-
#cc*a**3*ca*ccs*R**3+cc*a**3*cas*ccs*R**3+2*cc*rho**6*cas*ca+cc*rho
#**3*ca*ccs*R**3)
```

```
> fortran (za) ;
```

```
t0 = rho**2*a**2*(2*cas*siga*ccs*rho**4-a*cas*pt*ccs*rho**4+rho*a*
#cas*pt*ccs*R**3-2*rho*cas*siga*ccs*R**3-R**3*ccs*cc*rho*siga-R**3*
#ccs*cc*a*sigro-R**2*sigR*cc*a*ccs*rho-2*cc*rho**4*cas*siga-2*cc*a*
#cas*sigro*rho**3-2*rho*cc*a*cas*sigR*R**2)/(-2*ca*rho**6*cas*ccs+2
#*ca*rho**3*cas*ccs*R**3-2*cc*a**3*cas*ca*rho**3-cc*a**3*cas*ccs*rh
#o**3-cc*a**3*ca*ccs*R**3+cc*a**3*cas*ccs*R**3+2*cc*rho**6*cas*ca+c
#c*rho**3*ca*ccs*R**3)
```

```
> sig_r:=-2*ca*za/r^3+cc*c3+pt;
```

$$\begin{aligned}
\text{sig}_r := & -2 ca \rho^2 a^2 (2 cas \text{ siga } ccs \rho^4 - a cas \text{ pt } ccs \rho^4 + \rho a cas \text{ pt } ccs R^3 \\
& - 2 \rho cas \text{ siga } ccs R^3 - R^3 ccs cc \rho \text{ siga} - R^3 ccs cc a \text{ sigro} - R^2 \text{ sigR } cc a ccs \rho \\
& - 2 cc \rho^4 cas \text{ siga} - 2 cc a cas \text{ sigro } \rho^3 - 2 \rho cc a cas \text{ sigR } R^2) / ((-2 ca \rho^6 cas ccs \\
& + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 \\
& + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3) r^3) - cc (2 ca \rho^6 cas \text{ pt} \\
& + 4 ca \rho^5 cas \text{ sigro} + 4 ca \rho^3 cas \text{ sigR } R^2 + \text{pt } \rho^3 ca ccs R^3 - 2 ca \rho^3 cas \text{ pt } a^3 \\
& + 4 ca \rho^3 cas \text{ siga } a^2 + 2 ca \text{ sigR } R^2 ccs \rho^3 + 2 a^2 cas \text{ siga } ccs \rho^3 - a^3 cas \text{ pt } ccs \rho^3 \\
& + 2 ca ccs R^3 \text{ sigro } \rho^2 - a^3 \text{ pt } ca ccs R^3 + 2 a^2 \text{ siga } ca ccs R^3 + a^3 cas \text{ pt } ccs R^3 \\
& - 2 a^2 cas \text{ siga } ccs R^3) / (-2 ca \rho^6 cas ccs + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 \\
& - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3 \\
&) + \text{pt}
\end{aligned}$$

> **sig_phi := ca*za/r^3+cc*c3+pt;**

$$\begin{aligned}
\text{sig}_\phi := & ca \rho^2 a^2 (2 cas \text{ siga } ccs \rho^4 - a cas \text{ pt } ccs \rho^4 + \rho a cas \text{ pt } ccs R^3 \\
& - 2 \rho cas \text{ siga } ccs R^3 - R^3 ccs cc \rho \text{ siga} - R^3 ccs cc a \text{ sigro} - R^2 \text{ sigR } cc a ccs \rho \\
& - 2 cc \rho^4 cas \text{ siga} - 2 cc a cas \text{ sigro } \rho^3 - 2 \rho cc a cas \text{ sigR } R^2) / ((-2 ca \rho^6 cas ccs \\
& + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 \\
& + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3) r^3) - cc (2 ca \rho^6 cas \text{ pt} \\
& + 4 ca \rho^5 cas \text{ sigro} + 4 ca \rho^3 cas \text{ sigR } R^2 + \text{pt } \rho^3 ca ccs R^3 - 2 ca \rho^3 cas \text{ pt } a^3 \\
& + 4 ca \rho^3 cas \text{ siga } a^2 + 2 ca \text{ sigR } R^2 ccs \rho^3 + 2 a^2 cas \text{ siga } ccs \rho^3 - a^3 cas \text{ pt } ccs \rho^3 \\
& + 2 ca ccs R^3 \text{ sigro } \rho^2 - a^3 \text{ pt } ca ccs R^3 + 2 a^2 \text{ siga } ca ccs R^3 + a^3 cas \text{ pt } ccs R^3 \\
& - 2 a^2 cas \text{ siga } ccs R^3) / (-2 ca \rho^6 cas ccs + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 \\
& - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3 \\
&) + \text{pt}
\end{aligned}$$

> **eps_r_e := -2*za/r^3+c3+pt/cc;**

$$\begin{aligned}
\text{eps}_r_e := & -2 \rho^2 a^2 (2 cas \text{ siga } ccs \rho^4 - a cas \text{ pt } ccs \rho^4 + \rho a cas \text{ pt } ccs R^3 \\
& - 2 \rho cas \text{ siga } ccs R^3 - R^3 ccs cc \rho \text{ siga} - R^3 ccs cc a \text{ sigro} - R^2 \text{ sigR } cc a ccs \rho \\
& - 2 cc \rho^4 cas \text{ siga} - 2 cc a cas \text{ sigro } \rho^3 - 2 \rho cc a cas \text{ sigR } R^2) / ((-2 ca \rho^6 cas ccs \\
& + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 \\
& + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3) r^3) - (2 ca \rho^6 cas \text{ pt} \\
& + 4 ca \rho^5 cas \text{ sigro} + 4 ca \rho^3 cas \text{ sigR } R^2 + \text{pt } \rho^3 ca ccs R^3 - 2 ca \rho^3 cas \text{ pt } a^3 \\
& + 4 ca \rho^3 cas \text{ siga } a^2 + 2 ca \text{ sigR } R^2 ccs \rho^3 + 2 a^2 cas \text{ siga } ccs \rho^3 - a^3 cas \text{ pt } ccs \rho^3 \\
& + 2 ca ccs R^3 \text{ sigro } \rho^2 - a^3 \text{ pt } ca ccs R^3 + 2 a^2 \text{ siga } ca ccs R^3 + a^3 cas \text{ pt } ccs R^3 \\
& - 2 a^2 cas \text{ siga } ccs R^3) / (-2 ca \rho^6 cas ccs + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 \\
& - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3 \\
&) + \frac{\text{pt}}{cc}
\end{aligned}$$

> **eps_phi_e:=za/r^3+c3+pt/cc;**

$$\begin{aligned} \text{eps_phi_e} := & \rho^2 a^2 (2 \text{cas siga ccs } \rho^4 - a \text{cas pt ccs } \rho^4 + \rho a \text{cas pt ccs } R^3 \\ & - 2 \rho \text{cas siga ccs } R^3 - R^3 \text{ccs cc } \rho \text{sig a} - R^3 \text{ccs cc a sigro} - R^2 \text{sigR cc a ccs } \rho \\ & - 2 \text{cc } \rho^4 \text{cas sig a} - 2 \text{cc a cas sigro } \rho^3 - 2 \rho \text{cc a cas sigR } R^2) / ((-2 \text{ca } \rho^6 \text{cas ccs} \\ & + 2 \text{ca } \rho^3 \text{cas ccs } R^3 - 2 \text{cc } a^3 \text{cas ca } \rho^3 - \text{cc } a^3 \text{cas ccs } \rho^3 - \text{cc } a^3 \text{ca ccs } R^3 \\ & + \text{cc } a^3 \text{cas ccs } R^3 + 2 \text{cc } \rho^6 \text{cas ca} + \text{cc } \rho^3 \text{ca ccs } R^3) r^3) - (2 \text{ca } \rho^6 \text{cas pt} \\ & + 4 \text{ca } \rho^5 \text{cas sigro} + 4 \text{ca } \rho^3 \text{cas sigR } R^2 + \text{pt } \rho^3 \text{ca ccs } R^3 - 2 \text{ca } \rho^3 \text{cas pt } a^3 \\ & + 4 \text{ca } \rho^3 \text{cas sig a} a^2 + 2 \text{ca sigR } R^2 \text{ccs } \rho^3 + 2 a^2 \text{cas sig a ccs } \rho^3 - a^3 \text{cas pt ccs } \rho^3 \\ & + 2 \text{ca ccs } R^3 \text{sigro } \rho^2 - a^3 \text{pt ca ccs } R^3 + 2 a^2 \text{sig a ca ccs } R^3 + a^3 \text{cas pt ccs } R^3 \\ & - 2 a^2 \text{cas sig a ccs } R^3) / (-2 \text{ca } \rho^6 \text{cas ccs} + 2 \text{ca } \rho^3 \text{cas ccs } R^3 - 2 \text{cc } a^3 \text{cas ca } \rho^3 \\ & - \text{cc } a^3 \text{cas ccs } \rho^3 - \text{cc } a^3 \text{ca ccs } R^3 + \text{cc } a^3 \text{cas ccs } R^3 + 2 \text{cc } \rho^6 \text{cas ca} + \text{cc } \rho^3 \text{ca ccs } R^3 \\ &) + \frac{\text{pt}}{\text{cc}} \end{aligned}$$

> **sig_r_s:=-2*cas*as/r^3+ccs*cs3;**

$$\begin{aligned} \text{sig_r_s} := & 2 \text{cas } R^2 \rho^2 (2 \text{ccs } R \text{ca } \rho^3 \text{sigro} + \text{ccs } R \text{ca } \rho^4 \text{pt} + \text{ccs } R \text{cc } \rho \text{sig a} a^2 \\ & + \text{ccs } R \text{cc } a^3 \text{sigro} - \text{ccs } R \text{ca } \rho \text{pt } a^3 + 2 \text{ccs } R \text{ca } \rho \text{sig a} a^2 + 2 \text{sigR ca } \rho^4 \text{ccs} \\ & + 2 \text{sigR cc } a^3 \text{ca } \rho + \text{sigR cc } a^3 \text{ccs } \rho - 2 \text{sigR cc } \rho^4 \text{ca}) / ((-2 \text{ca } \rho^6 \text{cas ccs} \\ & + 2 \text{ca } \rho^3 \text{cas ccs } R^3 - 2 \text{cc } a^3 \text{cas ca } \rho^3 - \text{cc } a^3 \text{cas ccs } \rho^3 - \text{cc } a^3 \text{ca ccs } R^3 \\ & + \text{cc } a^3 \text{cas ccs } R^3 + 2 \text{cc } \rho^6 \text{cas ca} + \text{cc } \rho^3 \text{ca ccs } R^3) r^3) - 2 \text{ccs } (2 \text{ca } \rho^5 \text{cas sigro} \\ & + \text{ca } \rho^6 \text{cas pt} + \text{cc } \rho^3 \text{ca sigR } R^2 + \text{cc } \rho^3 \text{cas sig a} a^2 + 2 \text{ca } \rho^3 \text{cas sigR } R^2 \\ & - \text{cc } a^3 \text{ca sigR } R^2 + \text{cc } a^3 \text{cas sigro } \rho^2 - \text{ca } \rho^3 \text{cas pt } a^3 + 2 \text{ca } \rho^3 \text{cas sig a} a^2 \\ & + \text{cc } a^3 \text{cas sigR } R^2) / (-2 \text{ca } \rho^6 \text{cas ccs} + 2 \text{ca } \rho^3 \text{cas ccs } R^3 - 2 \text{cc } a^3 \text{cas ca } \rho^3 \\ & - \text{cc } a^3 \text{cas ccs } \rho^3 - \text{cc } a^3 \text{ca ccs } R^3 + \text{cc } a^3 \text{cas ccs } R^3 + 2 \text{cc } \rho^6 \text{cas ca} + \text{cc } \rho^3 \text{ca ccs } R^3 \\ &) \end{aligned}$$

> **sig_phi_s:=cas*as/r^3+ccs*cs3;**

$$\begin{aligned} \text{sig_phi_s} := & - \text{cas } R^2 \rho^2 (2 \text{ccs } R \text{ca } \rho^3 \text{sigro} + \text{ccs } R \text{ca } \rho^4 \text{pt} + \text{ccs } R \text{cc } \rho \text{sig a} a^2 \\ & + \text{ccs } R \text{cc } a^3 \text{sigro} - \text{ccs } R \text{ca } \rho \text{pt } a^3 + 2 \text{ccs } R \text{ca } \rho \text{sig a} a^2 + 2 \text{sigR ca } \rho^4 \text{ccs} \\ & + 2 \text{sigR cc } a^3 \text{ca } \rho + \text{sigR cc } a^3 \text{ccs } \rho - 2 \text{sigR cc } \rho^4 \text{ca}) / ((-2 \text{ca } \rho^6 \text{cas ccs} \\ & + 2 \text{ca } \rho^3 \text{cas ccs } R^3 - 2 \text{cc } a^3 \text{cas ca } \rho^3 - \text{cc } a^3 \text{cas ccs } \rho^3 - \text{cc } a^3 \text{ca ccs } R^3 \\ & + \text{cc } a^3 \text{cas ccs } R^3 + 2 \text{cc } \rho^6 \text{cas ca} + \text{cc } \rho^3 \text{ca ccs } R^3) r^3) - 2 \text{ccs } (2 \text{ca } \rho^5 \text{cas sigro} \\ & + \text{ca } \rho^6 \text{cas pt} + \text{cc } \rho^3 \text{ca sigR } R^2 + \text{cc } \rho^3 \text{cas sig a} a^2 + 2 \text{ca } \rho^3 \text{cas sigR } R^2 \\ & - \text{cc } a^3 \text{ca sigR } R^2 + \text{cc } a^3 \text{cas sigro } \rho^2 - \text{ca } \rho^3 \text{cas pt } a^3 + 2 \text{ca } \rho^3 \text{cas sig a} a^2 \\ & + \text{cc } a^3 \text{cas sigR } R^2) / (-2 \text{ca } \rho^6 \text{cas ccs} + 2 \text{ca } \rho^3 \text{cas ccs } R^3 - 2 \text{cc } a^3 \text{cas ca } \rho^3 \\ & - \text{cc } a^3 \text{cas ccs } \rho^3 - \text{cc } a^3 \text{ca ccs } R^3 + \text{cc } a^3 \text{cas ccs } R^3 + 2 \text{cc } \rho^6 \text{cas ca} + \text{cc } \rho^3 \text{ca ccs } R^3 \\ &) \end{aligned}$$

> **eps_r_e_s:=-2*as/r^3+cs3;**

$$\begin{aligned}
\text{eps_r_e_s} := & 2 R^2 \rho^2 (2 \text{ccs } R \text{ ca } \rho^3 \text{ sigro} + \text{ccs } R \text{ ca } \rho^4 \text{ pt} + \text{ccs } R \text{ cc } \rho \text{ siga } a^2 \\
& + \text{ccs } R \text{ cc } a^3 \text{ sigro} - \text{ccs } R \text{ ca } \rho \text{ pt } a^3 + 2 \text{ccs } R \text{ ca } \rho \text{ siga } a^2 + 2 \text{sigR } \text{ca } \rho^4 \text{ccs} \\
& + 2 \text{sigR } \text{cc } a^3 \text{ca } \rho + \text{sigR } \text{cc } a^3 \text{ccs } \rho - 2 \text{sigR } \text{cc } \rho^4 \text{ca}) / ((-2 \text{ca } \rho^6 \text{cas } \text{ccs} \\
& + 2 \text{ca } \rho^3 \text{cas } \text{ccs } R^3 - 2 \text{cc } a^3 \text{cas } \text{ca } \rho^3 - \text{cc } a^3 \text{cas } \text{ccs } \rho^3 - \text{cc } a^3 \text{ca } \text{ccs } R^3 \\
& + \text{cc } a^3 \text{cas } \text{ccs } R^3 + 2 \text{cc } \rho^6 \text{cas } \text{ca} + \text{cc } \rho^3 \text{ca } \text{ccs } R^3) r^3) - 2 (2 \text{ca } \rho^5 \text{cas } \text{sigro} \\
& + \text{ca } \rho^6 \text{cas } \text{pt} + \text{cc } \rho^3 \text{ca } \text{sigR } R^2 + \text{cc } \rho^3 \text{cas } \text{siga } a^2 + 2 \text{ca } \rho^3 \text{cas } \text{sigR } R^2 \\
& - \text{cc } a^3 \text{ca } \text{sigR } R^2 + \text{cc } a^3 \text{cas } \text{sigro } \rho^2 - \text{ca } \rho^3 \text{cas } \text{pt } a^3 + 2 \text{ca } \rho^3 \text{cas } \text{siga } a^2 \\
& + \text{cc } a^3 \text{cas } \text{sigR } R^2) / (-2 \text{ca } \rho^6 \text{cas } \text{ccs} + 2 \text{ca } \rho^3 \text{cas } \text{ccs } R^3 - 2 \text{cc } a^3 \text{cas } \text{ca } \rho^3 \\
& - \text{cc } a^3 \text{cas } \text{ccs } \rho^3 - \text{cc } a^3 \text{ca } \text{ccs } R^3 + \text{cc } a^3 \text{cas } \text{ccs } R^3 + 2 \text{cc } \rho^6 \text{cas } \text{ca} + \text{cc } \rho^3 \text{ca } \text{ccs } R^3 \\
&)
\end{aligned}$$

> **eps_phi_e_s:=as/r^3+cs3;**

$$\begin{aligned}
\text{eps_phi_e_s} := & -R^2 \rho^2 (2 \text{ccs } R \text{ ca } \rho^3 \text{ sigro} + \text{ccs } R \text{ ca } \rho^4 \text{ pt} + \text{ccs } R \text{ cc } \rho \text{ siga } a^2 \\
& + \text{ccs } R \text{ cc } a^3 \text{ sigro} - \text{ccs } R \text{ ca } \rho \text{ pt } a^3 + 2 \text{ccs } R \text{ ca } \rho \text{ siga } a^2 + 2 \text{sigR } \text{ca } \rho^4 \text{ccs} \\
& + 2 \text{sigR } \text{cc } a^3 \text{ca } \rho + \text{sigR } \text{cc } a^3 \text{ccs } \rho - 2 \text{sigR } \text{cc } \rho^4 \text{ca}) / ((-2 \text{ca } \rho^6 \text{cas } \text{ccs} \\
& + 2 \text{ca } \rho^3 \text{cas } \text{ccs } R^3 - 2 \text{cc } a^3 \text{cas } \text{ca } \rho^3 - \text{cc } a^3 \text{cas } \text{ccs } \rho^3 - \text{cc } a^3 \text{ca } \text{ccs } R^3 \\
& + \text{cc } a^3 \text{cas } \text{ccs } R^3 + 2 \text{cc } \rho^6 \text{cas } \text{ca} + \text{cc } \rho^3 \text{ca } \text{ccs } R^3) r^3) - 2 (2 \text{ca } \rho^5 \text{cas } \text{sigro} \\
& + \text{ca } \rho^6 \text{cas } \text{pt} + \text{cc } \rho^3 \text{ca } \text{sigR } R^2 + \text{cc } \rho^3 \text{cas } \text{siga } a^2 + 2 \text{ca } \rho^3 \text{cas } \text{sigR } R^2 \\
& - \text{cc } a^3 \text{ca } \text{sigR } R^2 + \text{cc } a^3 \text{cas } \text{sigro } \rho^2 - \text{ca } \rho^3 \text{cas } \text{pt } a^3 + 2 \text{ca } \rho^3 \text{cas } \text{siga } a^2 \\
& + \text{cc } a^3 \text{cas } \text{sigR } R^2) / (-2 \text{ca } \rho^6 \text{cas } \text{ccs} + 2 \text{ca } \rho^3 \text{cas } \text{ccs } R^3 - 2 \text{cc } a^3 \text{cas } \text{ca } \rho^3 \\
& - \text{cc } a^3 \text{cas } \text{ccs } \rho^3 - \text{cc } a^3 \text{ca } \text{ccs } R^3 + \text{cc } a^3 \text{cas } \text{ccs } R^3 + 2 \text{cc } \rho^6 \text{cas } \text{ca} + \text{cc } \rho^3 \text{ca } \text{ccs } R^3 \\
&)
\end{aligned}$$

> **U:=2*Pi/cc*(2*ca*cc*za^2*(1/(a^3)-1/(rho^3))+(cc*c3+pt)^2*(rho^3-a^3));**

$$\begin{aligned}
U := & 2 \pi \left(2 \text{ca } \text{cc } \rho^4 a^4 (2 \text{cas } \text{siga } \text{ccs } \rho^4 - a \text{cas } \text{pt } \text{ccs } \rho^4 + \rho a \text{cas } \text{pt } \text{ccs } R^3 \right. \\
& - 2 \rho \text{cas } \text{siga } \text{ccs } R^3 - R^3 \text{ccs } \text{cc } \rho \text{siga} - R^3 \text{ccs } \text{cc } a \text{sigo} - R^2 \text{sigR } \text{cc } a \text{ccs } \rho \\
& - 2 \text{cc } \rho^4 \text{cas } \text{siga} - 2 \text{cc } a \text{cas } \text{sigo} \rho^3 - 2 \rho \text{cc } a \text{cas } \text{sigR } R^2) \left(\frac{1}{a^3} - \frac{1}{\rho^3} \right) / (\\
& -2 \text{ca } \rho^6 \text{cas } \text{ccs} + 2 \text{ca } \rho^3 \text{cas } \text{ccs } R^3 - 2 \text{cc } a^3 \text{cas } \text{ca } \rho^3 - \text{cc } a^3 \text{cas } \text{ccs } \rho^3 \\
& - \text{cc } a^3 \text{ca } \text{ccs } R^3 + \text{cc } a^3 \text{cas } \text{ccs } R^3 + 2 \text{cc } \rho^6 \text{cas } \text{ca} + \text{cc } \rho^3 \text{ca } \text{ccs } R^3) + (-\text{cc} (\\
& 2 \text{ca } \rho^6 \text{cas } \text{pt} + 4 \text{ca } \rho^5 \text{cas } \text{sigro} + 4 \text{ca } \rho^3 \text{cas } \text{sigR } R^2 + \text{pt } \rho^3 \text{ca } \text{ccs } R^3 \\
& - 2 \text{ca } \rho^3 \text{cas } \text{pt } a^3 + 4 \text{ca } \rho^3 \text{cas } \text{siga } a^2 + 2 \text{ca } \text{sigR } R^2 \text{ccs } \rho^3 + 2 a^2 \text{cas } \text{siga } \text{ccs } \rho^3 \\
& - a^3 \text{cas } \text{pt } \text{ccs } \rho^3 + 2 \text{ca } \text{ccs } R^3 \text{sigo} \rho^2 - a^3 \text{pt } \text{ca } \text{ccs } R^3 + 2 a^2 \text{siga } \text{ca } \text{ccs } R^3 \\
& + a^3 \text{cas } \text{pt } \text{ccs } R^3 - 2 a^2 \text{cas } \text{siga } \text{ccs } R^3) / (-2 \text{ca } \rho^6 \text{cas } \text{ccs} + 2 \text{ca } \rho^3 \text{cas } \text{ccs } R^3 \\
&)
\end{aligned}$$

$$-2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 + cc a^3 cas ccs R^3 \\ + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3 + pt)^2 (\rho^3 - a^3) \Big) / cc$$

> **Us := 2*Pi/ccs*(2*cas*ccs*as^2*(1/(rho^3) - 1/(R^3)) + (ccs*cs3)^2*(R^3-rho^3));**

$$Us := 2 \pi \left(2 cas ccs R^4 \rho^4 (2 ccs R ca \rho^3 sigro + ccs R ca \rho^4 pt + ccs R cc \rho siga a^2 \right. \\ + ccs R cc a^3 sigro - ccs R ca \rho pt a^3 + 2 ccs R ca \rho siga a^2 + 2 sigR ca \rho^4 ccs \\ + 2 sigR cc a^3 ca \rho + sigR cc a^3 ccs \rho - 2 sigR cc \rho^4 ca)^2 \left(\frac{1}{\rho^3} - \frac{1}{R^3} \right) / (\\ -2 ca \rho^6 cas ccs + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 \\ - cc a^3 ca ccs R^3 + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3)^2 + 4 ccs^2 (\\ 2 ca \rho^5 cas sigro + ca \rho^6 cas pt + cc \rho^3 ca sigR R^2 + cc \rho^3 cas siga a^2 \\ + 2 ca \rho^3 cas sigR R^2 - cc a^3 ca sigR R^2 + cc a^3 cas sigro \rho^2 - ca \rho^3 cas pt a^3 \\ + 2 ca \rho^3 cas siga a^2 + cc a^3 cas sigR R^2)^2 (R^3 - \rho^3) / (-2 ca \rho^6 cas ccs \\ + 2 ca \rho^3 cas ccs R^3 - 2 cc a^3 cas ca \rho^3 - cc a^3 cas ccs \rho^3 - cc a^3 ca ccs R^3 \\ + cc a^3 cas ccs R^3 + 2 cc \rho^6 cas ca + cc \rho^3 ca ccs R^3)^2 \Big) / ccs$$

> **ca:=168.-121.; cc:=168.+2.*121.; cas:=122.-106.; ccs:=122.+2.*106.;**

ca := 47.

cc := 410.

cas := 16.

ccs := 334.

>

za_n:=evalf(za); c3_n:=evalf(c3); as_n:=evalf(as); cs3_n:=evalf(cs3); U_n:=evalf(U); Us_n:=evalf(Us);

$$za_n := \rho^2 a^2 (-2432. siga \rho^4 - 5344. a pt \rho^4 + 5344. \rho a pt R^3 - 147628. \rho siga R^3 \\ - 136940. R^3 a sigro - 150060. R^2 sigR a \rho - 13120. a sigro \rho^3) / (\\ 114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3 - 0.2807680 10^7 a^3 \rho^3 - 0.4245140 10^7 a^3 R^3) \\ c3_n := -1. (1504. \rho^6 pt + 3008. \rho^5 sigro + 34404. \rho^3 sigR R^2 + 15698. pt \rho^3 R^3 \\ - 6848. \rho^3 pt a^3 + 13696. \rho^3 siga a^2 + 31396. R^3 sigro \rho^2 - 10354. a^3 pt R^3 \\ + 20708. a^2 siga R^3) / (\\ 114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3 - 0.2807680 10^7 a^3 \rho^3 - 0.4245140 10^7 a^3 R^3)$$

$$\begin{aligned}
as_n &:= -1. R^2 \rho^2 (31396. R \rho^3 sigro + 15698. R \rho^4 pt + 168336. R \rho siga a^2 \\
&\quad + 136940. R a^3 sigro - 15698. R \rho pt a^3 - 7144. sigR \rho^4 + 175480. sigR a^3 \rho) / (\\
&\quad 114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3 - 0.2807680 10^7 a^3 \rho^3 - 0.4245140 10^7 a^3 R^3) \\
cs3_n &:= -2. (1504. \rho^5 sigro + 752. \rho^6 pt + 20774. \rho^3 sigR R^2 + 8064. \rho^3 siga a^2 \\
&\quad - 12710. a^3 sigR R^2 + 6560. a^3 sigro \rho^2 - 752. \rho^3 pt a^3) / (\\
&\quad 114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3 - 0.2807680 10^7 a^3 \rho^3 - 0.4245140 10^7 a^3 R^3) \\
U_n &:= 590.6194190 \rho^4 a^4 (-2432. siga \rho^4 - 5344. a pt \rho^4 + 5344. \rho a pt R^3 \\
&\quad - 147628. \rho siga R^3 - 136940. R^3 a sigro - 150060. R^2 sigR a \rho - 13120. a sigro \rho^3)^2 \\
&\quad \left(\frac{1}{a^3} - \frac{1}{\rho^3} \right) / \\
&\quad (114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3 - 0.2807680 10^7 a^3 \rho^3 - 0.4245140 10^7 a^3 R^3)^2 + \\
&\quad 0.01532484221 (-410. (1504. \rho^6 pt + 3008. \rho^5 sigro + 34404. \rho^3 sigR R^2 \\
&\quad + 15698. pt \rho^3 R^3 - 6848. \rho^3 pt a^3 + 13696. \rho^3 siga a^2 + 31396. R^3 sigro \rho^2 \\
&\quad - 10354. a^3 pt R^3 + 20708. a^2 siga R^3) / (\\
&\quad 114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3 - 0.2807680 10^7 a^3 \rho^3 - 0.4245140 10^7 a^3 R^3) + pt)^2 \\
&\quad (\rho^3 - 1. a^3)
\end{aligned}$$

$$\begin{aligned}
Us_n &:= 201.0619299 R^4 \rho^4 (31396. R \rho^3 sigro + 15698. R \rho^4 pt + 168336. R \rho siga a^2 \\
&\quad + 136940. R a^3 sigro - 15698. R \rho pt a^3 - 7144. sigR \rho^4 + 175480. sigR a^3 \rho)^2 \\
&\quad \left(\frac{1}{\rho^3} - \frac{1}{R^3} \right) / \\
&\quad (114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3 - 0.2807680 10^7 a^3 \rho^3 - 0.4245140 10^7 a^3 R^3)^2 + \\
&\quad 8394.335569 (1504. \rho^5 sigro + 752. \rho^6 pt + 20774. \rho^3 sigR R^2 + 8064. \rho^3 siga a^2 \\
&\quad - 12710. a^3 sigR R^2 + 6560. a^3 sigro \rho^2 - 752. \rho^3 pt a^3)^2 (R^3 - 1. \rho^3) / \\
&\quad (114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3 - 0.2807680 10^7 a^3 \rho^3 - 0.4245140 10^7 a^3 R^3)^2
\end{aligned}$$

> **a:=0;**

$$a := 0$$

>

za_n:=evalf(za); c3_n:=evalf(c3); as_n:=evalf(as); cs3_n:=evalf(cs3);

$$za_n := 0.$$

$$\begin{aligned}
c3_n &:= -1. (1504. \rho^6 pt + 3008. \rho^5 sigro + 34404. \rho^3 sigR R^2 + 15698. pt \rho^3 R^3 \\
&\quad + 31396. R^3 sigro \rho^2) / (114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3)
\end{aligned}$$

$$as_n := -\frac{1. R^2 \rho^2 (31396. R \rho^3 sigro + 15698. R \rho^4 pt - 7144. sigR \rho^4)}{114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3}$$

$$cs3_n := -\frac{2. (1504. \rho^5 sigro + 752. \rho^6 pt + 20774. \rho^3 sigR R^2)}{114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3}$$

> **za_n1:=limit(za_n, R=infinity);c3_n1:=limit(c3_n, R=infinity);as_n1:=limit(as_n, R=infinity); cs3_n1:=limit(cs3_n, R=infinity);**

$$za_n1 := 0.$$

$$c3_n1 := -\frac{0.002262443439 (pt \rho + 2. sigro)}{\rho}$$

$$as_n1 := -0.002262443439 \rho^2 (pt \rho + 2. sigro)$$

$$cs3_n1 := 0.$$

> **U:=limit(2*Pi/cc*(2*ca*cc*za_n^2*(1/(a^3)-1/(rho^3)))+(cc*c3_n+pt)^2*(rho^3-a^3), a=0);**

Error, numeric exception: division by zero

> **U_n:=2*Pi/cc*((cc*c3_n+pt)^2*(rho^3-a^3));**

$$U_n := 0.004878048780 \pi (-410. (1504. \rho^6 pt + 3008. \rho^5 sigro + 34404. \rho^3 sigR R^2 + 15698. pt \rho^3 R^3 + 31396. R^3 sigro \rho^2) / ((114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3) + pt)^2 \rho^3$$

> **Us_n:=2*Pi/ccs*(2*cas*ccs*as_n^2*(1/(rho^3)-1/(R^3)))+(ccs*cs3_n)^2*(R^3-rho^3);**

$$Us_n := 0.005988023952 \pi \left(\frac{10688. R^4 \rho^4 (31396. R \rho^3 sigro + 15698. R \rho^4 pt - 7144. sigR \rho^4)^2 \left(\frac{1}{\rho^3} - \frac{1}{R^3} \right)}{(114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3)^2} + \frac{446224. (1504. \rho^5 sigro + 752. \rho^6 pt + 20774. \rho^3 sigR R^2)^2 (R^3 - \rho^3)}{(114304. \rho^6 + 0.6938516 10^7 \rho^3 R^3)^2} \right)$$

> **U_n1:=limit(U_n, R=infinity);**

$$U_n1 :=$$

$$0.05274474266 \rho sigro^2 - 0.004116662840 \rho^2 sigro pt + 0.00008032512860 \rho^3 pt^2$$

> **Us_n1:=limit(Us_n, R=infinity);**

$$Us_n1 := \text{Float}(\infty) \text{signum}(sigR)^2$$

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