In[1]:=
```
$Assumptions = {(fd * t + fk * t * t * 0.5) > 0}
Integrate[(cd + ck * t) (fd + fk * t) Exp[-(fd * t + fk * t * t * 0.5)], {t, ti, tipd}]
```

Out[1]= $\left\{\text{fd}\, t + 0.5\, \text{fk}\, t^2 > 0\right\}$

Out[2]= $Aborted

In[20]:=
```
Integrate[(cd + ck * t) (fd + fk * t) Exp[-((fd * t + fk * t * t)/2)], {t, ti, tipd},
 Assumptions -> {(fd * t + fk * t * t)/2 > 0, Element[{t, fd, fk, cd, ck, ti, tipd}, Reals]}]
```

Out[20]=

$$\left(e^{-\frac{\text{fd}^2+4\,\text{fd}\,\text{fk}\,(\text{ti}+\text{tipd})+4\,\text{fk}^2\,(\text{ti}^2+\text{tipd}^2)}{8\,\text{fk}}}\left(-e^{\frac{\text{fd}^2+2\,\text{fd}\,\text{fk}\,(\text{ti}+\text{tipd})+2\,\text{fk}^2\,(\text{ti}^2+\text{tipd}^2)}{4\,\text{fk}}}\sqrt{\frac{1}{\text{fk}}}\,\left(-\text{ck}\,\text{fd}^2+4\,\text{ck}\,\text{fk}+2\,\text{cd}\,\text{fd}\,\text{fk}\right)\right.\right.$$

$$\sqrt{\pi}\,(\text{fd}+2\,\text{fk}\,\text{tipd})\,\text{Abs}[\text{fd}+2\,\text{fk}\,\text{ti}]\,\text{Erf}\left[\frac{\sqrt{\frac{1}{\text{fk}}}\,\text{Abs}[\text{fd}+2\,\text{fk}\,\text{ti}]}{2\sqrt{2}}\right]+$$

$$(\text{fd}+2\,\text{fk}\,\text{ti})\left(-2\sqrt{2}\,(\text{fd}+2\,\text{fk}\,\text{tipd})\left(2\,\text{cd}\left(e^{\frac{(\text{fd}+2\,\text{fk}\,\text{ti})^2}{8\,\text{fk}}}-e^{\frac{(\text{fd}+2\,\text{fk}\,\text{tipd})^2}{8\,\text{fk}}}\right)\text{fk}-\right.\right.$$

$$\text{ck}\,e^{\frac{(\text{fd}+2\,\text{fk}\,\text{tipd})^2}{8\,\text{fk}}}\,(\text{fd}+2\,\text{fk}\,\text{ti})+\text{ck}\,e^{\frac{(\text{fd}+2\,\text{fk}\,\text{ti})^2}{8\,\text{fk}}}\,(\text{fd}+2\,\text{fk}\,\text{tipd})\Big)+$$

$$e^{\frac{\text{fd}^2+2\,\text{fd}\,\text{fk}\,(\text{ti}+\text{tipd})+2\,\text{fk}^2\,(\text{ti}^2+\text{tipd}^2)}{4\,\text{fk}}}\sqrt{\frac{1}{\text{fk}}}\,\left(-\text{ck}\,\text{fd}^2+4\,\text{ck}\,\text{fk}+2\,\text{cd}\,\text{fd}\,\text{fk}\right)\sqrt{\pi}$$

$$\left.\left.\left.\text{Abs}[\text{fd}+2\,\text{fk}\,\text{tipd}]\,\text{Erf}\left[\frac{\sqrt{\frac{1}{\text{fk}}}\,\text{Abs}[\text{fd}+2\,\text{fk}\,\text{tipd}]}{2\sqrt{2}}\right]\right)\right)\right)\Big/$$

$$\left(4\sqrt{2}\,\text{fk}\,(\text{fd}+2\,\text{fk}\,\text{ti})\,(\text{fd}+2\,\text{fk}\,\text{tipd})\right)$$

In[21]:= **% // Simplify**

Out[21]=

$$\left(e^{-\frac{fd^2+4\,fd\,fk\,(ti+tipd)+4\,fk^2\,(ti^2+tipd^2)}{8\,fk}}\left(-e^{\frac{fd^2+2\,fd\,fk\,(ti+tipd)+2\,fk^2\,(ti^2+tipd^2)}{4\,fk}}\sqrt{\frac{1}{fk}}\,\left(-ck\,fd^2+4\,ck\,fk+2\,cd\,fd\,fk\right)\right.\right.$$

$$\sqrt{\pi}\,(fd+2\,fk\,tipd)\,Abs[fd+2\,fk\,ti]\,Erf\left[\frac{\sqrt{\frac{1}{fk}}\,Abs[fd+2\,fk\,ti]}{2\,\sqrt{2}}\right]+$$

$$(fd+2\,fk\,ti)\left(-2\,\sqrt{2}\,(fd+2\,fk\,tipd)\left(2\,cd\left(e^{\frac{(fd+2\,fk\,ti)^2}{8\,fk}}-e^{\frac{(fd+2\,fk\,tipd)^2}{8\,fk}}\right)fk-\right.\right.$$

$$ck\,e^{\frac{(fd+2\,fk\,tipd)^2}{8\,fk}}\,(fd+2\,fk\,ti)+ck\,e^{\frac{(fd+2\,fk\,ti)^2}{8\,fk}}\,(fd+2\,fk\,tipd)\Big)+$$

$$e^{\frac{fd^2+2\,fd\,fk\,(ti+tipd)+2\,fk^2\,(ti^2+tipd^2)}{4\,fk}}\sqrt{\frac{1}{fk}}\,\left(-ck\,fd^2+4\,ck\,fk+2\,cd\,fd\,fk\right)\sqrt{\pi}$$

$$\left.\left.\left.Abs[fd+2\,fk\,tipd]\,Erf\left[\frac{\sqrt{\frac{1}{fk}}\,Abs[fd+2\,fk\,tipd]}{2\,\sqrt{2}}\right]\right)\right)\right)\Big/$$

$$\left(4\,\sqrt{2}\,fk\,(fd+2\,fk\,ti)\,(fd+2\,fk\,tipd)\right)$$

In[22]:= **% // CForm**

Out[22]//CForm=

```
(-(Power(E,(Power(fd,2) + 2*fd*fk*(ti + tipd) +
              2*Power(fk,2)*(Power(ti,2) + Power(tipd,2)))/(4.*fk))*Sqrt(1/fk)*
         (-(ck*Power(fd,2)) + 4*ck*fk + 2*cd*fd*fk)*Sqrt(Pi)*(fd + 2*fk*tipd)*
         Abs(fd + 2*fk*ti)*Erf((Sqrt(1/fk)*Abs(fd + 2*fk*ti))/(2.*Sqrt(2)))) +
      (fd + 2*fk*ti)*(-2*Sqrt(2)*(fd + 2*fk*tipd)*
         (2*cd*(Power(E,Power(fd + 2*fk*ti,2)/(8.*fk)) -
              Power(E,Power(fd + 2*fk*tipd,2)/(8.*fk)))*fk -
           ck*Power(E,Power(fd + 2*fk*tipd,2)/(8.*fk))*(fd + 2*fk*ti) +
           ck*Power(E,Power(fd + 2*fk*ti,2)/(8.*fk))*(fd + 2*fk*tipd)) +
         Power(E,(Power(fd,2) + 2*fd*fk*(ti + tipd) +
              2*Power(fk,2)*(Power(ti,2) + Power(tipd,2)))/(4.*fk))*Sqrt(1/fk)*
         (-(ck*Power(fd,2)) + 4*ck*fk + 2*cd*fd*fk)*Sqrt(Pi)*Abs(fd + 2*fk*tipd)*
         Erf((Sqrt(1/fk)*Abs(fd + 2*fk*tipd))/(2.*Sqrt(2))))))/
   (4.*Sqrt(2)*Power(E,(Power(fd,2) + 4*fd*fk*(ti + tipd) +
         4*Power(fk,2)*(Power(ti,2) + Power(tipd,2)))/(8.*fk))*fk*(fd + 2*fk*ti)*
    (fd + 2*fk*tipd))
```

In[23]:= **% // TeXForm**

Out[23]//TeXForm=

```
\frac{\exp \left(-\frac{\text{fd}^2+4 \text{fd} \text{fk} (\text{ti}+\text{tipd})
   \text{fk}^2 \left(\text{ti}^2+\text{tipd}^2\right)}{8 \text{fk}}\right)
   \left((\text{fd}+2 \text{fk} \text{ti}) \left(\sqrt{\pi } \sqrt{\frac{1}{\text
   \text{fd}+2 \text{fk} \text{tipd}}| \left(2 \text{cd} \text{fd} \text{fk}-\te
   \text{fd}^2+4 \text{ck} \text{fk}\right)
   \text{erf}\left(\frac{\sqrt{\frac{1}{\text{fk}}} | \text{fd}+2 \text{fk} \text
   }{2 \sqrt{2}}\right) \exp \left(\frac{\text{fd}^2+2 \text{fd} \text{fk}
   (\text{ti}+\text{tipd})+2 \text{fk}^2 \left(\text{ti}^2+\text{tipd}^2\right)}{
   \text{fk}}\right)-2 \sqrt{2} (\text{fd}+2 \text{fk} \text{tipd}) \left(2 \text
   \text{fk} \left(e^{\frac{(\text{fd}+2 \text{fk} \text{ti})^2}{8
   \text{fk}}}-e^{\frac{(\text{fd}+2 \text{fk} \text{tipd})^2}{8
   \text{fk}}}\right)-\text{ck} (\text{fd}+2 \text{fk} \text{ti}) e^{\frac{(\text
   \text{fk} \text{tipd})^2}{8 \text{fk}}}+\text{ck} e^{\frac{(\text{fd}+2 \text
   \text{ti})^2}{8 \text{fk}}} (\text{fd}+2 \text{fk}
   \text{tipd})\right)\right)-\sqrt{\pi } \sqrt{\frac{1}{\text{fk}}} (\text{fd}+2
   \text{fk} \text{tipd}) | \text{fd}+2 \text{fk} \text{ti}| \left(2 \text{cd}
   \text{fk}-\text{ck} \text{fd}^2+4 \text{ck} \text{fk}\right)
   \text{erf}\left(\frac{\sqrt{\frac{1}{\text{fk}}} | \text{fd}+2 \text{fk} \text
   }{2 \sqrt{2}}\right) \exp \left(\frac{\text{fd}^2+2 \text{fd} \text{fk}
   (\text{ti}+\text{tipd})+2 \text{fk}^2 \left(\text{ti}^2+\text{tipd}^2\right)}{
   \text{fk}}\right)\right)}{4 \sqrt{2} \text{fk} (\text{fd}+2 \text{fk} \text{t
   (\text{fd}+2 \text{fk} \text{tipd})}
```