
Formulas

```
Distance[T1_, T2_] :=  
  √((T1[[1]] - T2[[1]])2 + (T1[[2]] - T2[[2]])2 +  
    (T1[[3]] - T2[[3]])2)
```

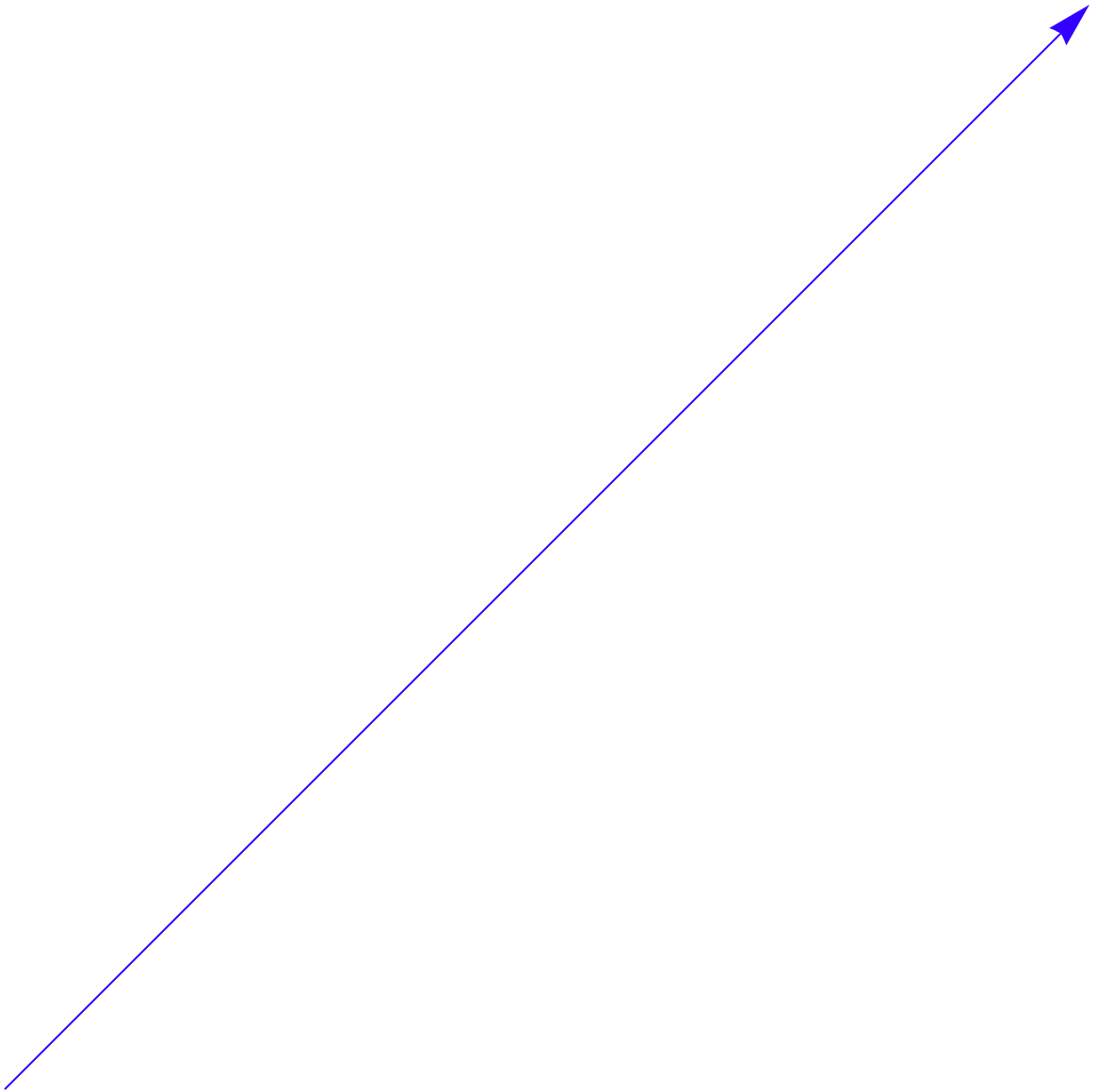
```
RotateMe[α_, Vector_] :=  
  ⎡ Cos[α]  0 Sin[α] ⎤  
  ⎣  0      1  0     ⎦.Vector  
  ⎣ -Sin[α] 0 Cos[α] ⎦
```

```
RotateMe[b, {1, 0, 0}]
```

```
{Cos[b], 0, -Sin[b]}
```

```
DrawVector[Vector_, Origin_, Hu_] := Graphics[  
  {Hue[Hu], Arrow[{{Origin[[1]], Origin[[3]]},  
    {Vector[[1]], Vector[[3]]}}]}
```

```
DrawVector[{1, 0, 1}, {0, 0, 0}, 0.7]
```



Detector Package

```
T3 = RotateMe[ $\pi$ ,
  {178.37 * Sin[70 * 3.141592654 / 180], -40.84,
   -178.37 * Cos[70 * 3.141592654 / 180]} / 100]
```

```
{-1.67613, -0.4084, 0.610061}
```

```
DSCenter =
```

```
RotateMe[ $\pi$ , {109.22, -16.08, -39.75} *  $\frac{2.54}{100}$ ]
```

```
{-2.77419, -0.408432, 1.00965}
```

```
DSFA =
```

```
RotateMe[ $\pi$ , {161.85, -9.43, -34.86} *  $\frac{2.54}{100}$ ]
```

```
DSFB = RotateMe[ $\pi$ ,
```

```
{146.32, -9.45, -77.42} *  $\frac{2.54}{100}$ ]
```

```
{-4.11099, -0.239522, 0.885444}
```

```
{-3.71653, -0.24003, 1.96647}
```

```
DSA = DSFA - DSCenter
```

```
DSB = DSFB - DSCenter
```

```
{-1.3368, 0.16891, -0.124206}
```

```
{-0.94234, 0.168402, 0.956818}
```

Distance [DSA, DSB]

1.15074

**DSA2 = RotateMe [-74 * 0.0174533,
RotateMe [+70 * 0.0174533, DSA]]**

**DSB2 = RotateMe [-74 * 0.0174533,
RotateMe [+70 * 0.0174533, DSB]]**

**T32 = RotateMe [-74 * 0.0174533,
RotateMe [+70 * 0.0174533, T3]]**

{-1.32488, 0.16891, -0.217154}

{-1.00679, 0.168402, 0.888753}

{-1.7146, -0.4084, 0.491654}

Halla C. System

TCenter =

{59 967.04157, 2100.03421, 79 606.96892};

TBA = {59 970.73701, 2099.80731, 79 609.02440};

TBB = {59 971.16468, 2099.80379, 79 607.95450};

TBC = {59 970.57548, 2100.90628, 79 608.01566};

TBD = {59 970.35411, 2100.90368, 79 608.57524};

TBE = {59 969.87988, 2101.74535, 79 608.68002};

TBF = {59 970.30655, 2101.74201, 79 607.61103};

(* TA=TBA - TCenter

TB=TBB - TCenter *)

TA = RotateMe [-2.4871, TBA - TCenter]

TB = RotateMe [-2.4871, TBB - TCenter]

{-4.18309, -0.2269, 0.618895}

{-3.87108, -0.23042, 1.72805}

Distance[TA, TB]

1.15222

Final Calculation

TColli1 = TA - T32 - DSA2

TColli2 = TB - T32 - DSB2

{-1.14361, 0.01259, 0.344395}

{-1.14968, 0.009578, 0.347647}

TColli1 - TColli2

{0.00607868, 0.003012, -0.00325259}

Distance[TColli1, {0, 0, 0}]

1.1944

Distance[TColli2, {0, 0, 0}]

1.20114

**Distance[TColli2, {0, 0, 0}] -
Distance[TColli1, {0, 0, 0}]**

0.00673098

```
Show[{DrawVector[T3, {0, 0, 0}, 0],
      DrawVector[DSA + T3, T3, 0],
      DrawVector[DSB + T3, T3, 0]},
      {DrawVector[T32, {0, 0, 0}, 0.7],
      DrawVector[DSA2 + T32, T32, 0.7],
      DrawVector[DSB2 + T32, T32, 0.7]},
      {DrawVector[TA, {0, 0, 0}, 0.3],
      DrawVector[TB, {0, 0, 0}, 0.3]},
      {DrawVector[TColli1, {0, 0, 0}, 0.5],
      DrawVector[TColli1 + T32, TColli1, 0.5],
      DrawVector[TColli1 + T32 + DSA2,
      TColli1 + T32, 0.5], DrawVector[
      TColli1 + T32 + DSB2, TColli1 + T32, 0.5]},
      {DrawVector[TColli2, {0, 0, 0}, 0.9],
      DrawVector[TColli2 + T32, TColli2, 0.9],
      DrawVector[TColli2 + T32 + DSA2, TColli2 + T32,
      0.9], DrawVector[TColli2 + T32 + DSB2,
      TColli2 + T32, 0.9]}, Axes → True]
```

