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LeeSmithSBCC / Jupyter-Math-For-Nerds

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Jupyter-Math-For-Nerds / Jupiter-Files / MathWithSymPy_TRIANGLES_082918.ipynb

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LeeSmithSBCC Added Triangles

bd1b52c 12 minutes ago

1 contributor

384 lines (383 sloc) 11 KB

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History



In [1]: `from sympy import Triangle as tr`

In [2]: `%%HTML
`



In [3]: `%%HTML

https://www.mathsisfun.com/algebra/trig-solving-triangles.html`



In [4]: `from sympy import geometry
from sympy.geometry import *
lee_sss = tr(sss=(3, 4, 5))
lee_sss`

Out[4]:



In [5]: `lee_sss.angles`

Out[5]: `{Point2D(3, 0): pi/2, Point2D(0, 0): acos(3/5), Point2D(3, 4): acos(4/5)}`

In [7]: `leeKeys = lee_sss.angles.keys(); leeKeys`

Out[7]: `dict_keys([Point2D(3, 0), Point2D(0, 0), Point2D(3, 4)])`

In [12]: `lee_sss.sides`

Out[12]: `[Segment(Point2D(0, 0), Point2D(3, 0)),
Segment(Point2D(3, 0), Point2D(3, 4)),
Segment(Point2D(0, 0), Point2D(3, 4))]`

In [15]: `lee_asa = tr(asa=(30, 1, 30))
lee_asa`

Out[15]:



In [16]: `lee_asa.angles`

Out[16]: `{Point2D(1/2, sqrt(3)/6): 2*pi/3, Point2D(1, 0): pi/6, Point2D(0, 0): pi/6}`

```
In [17]: lee_asa.sides
```

```
Out[17]: [Segment(Point2D(0, 0), Point2D(1, 0)),  
          Segment(Point2D(1/2, sqrt(3)/6), Point2D(1, 0)),  
          Segment(Point2D(0, 0), Point2D(1/2, sqrt(3)/6))]
```

```
In [18]: lee_sas = tr(sas=(1, 45, 2))  
lee_sas
```

```
Out[18]:
```



```
In [19]: lee_sas.angles
```

```
Out[19]: {Point2D(2, 0): acos((-sqrt(2) + 4)/(2*sqrt(1/2 + (-sqrt(2)/2 + 2)**2))),  
          Point2D(sqrt(2)/2, sqrt(2)/2): acos((-sqrt(2)*(-sqrt(2)/2 + 2)/2 + 1/2)/sqrt(1/2 + (-2 + sqrt(2)/2)**  
          2)),  
          Point2D(0, 0): pi/4}
```

```
In [20]: lee_sas.sides
```

```
Out[20]: [Segment(Point2D(0, 0), Point2D(2, 0)),  
          Segment(Point2D(sqrt(2)/2, sqrt(2)/2), Point2D(2, 0)),  
          Segment(Point2D(0, 0), Point2D(sqrt(2)/2, sqrt(2)/2))]
```

