

CAUG Class 3

Simple Geometry: Cylinders

Example geometry with cylinder surfaces

C Cells

```
99 0 1:2:-3 imp:p=0 $ Outside world
20 0 -1 -2 3 imp:p=1 $
```

C Surfaces

```
1 cx 5 $ radius of cylinder
2 px 10 $ top plane of cylinder
3 px -10 $ bottom plane of cylinder
```

c notice how the cylinder being perpendicular to x (CX) means top and bottom planes are PX. The same will be true if you have a perpendicular to y (CY) and perpendicular to z (CZ) cylinder

C Physics

c we won't focus on this for now

```
mode p
```

```
nps 1000
```

```
sdef erg=1 par=p
```

Example geometry with cylinder surfaces

C Cells

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99 0 1:2:-3 imp:p=0 $ Outside world
20 0 -1 -2 3 imp:p=1 $
```

C Surfaces

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1 cy 5 $ radius of cylinder
2 py 10 $ top plane of cylinder
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Example geometry with cylinder surfaces

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99 0 1:2:-3 imp:p=0 $ Outside world
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C Surfaces

```
1 cz 5 $ radius of cylinder
2 pz 10 $ top plane of cylinder
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C Physics

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```
mode p
```

```
nps 1000
```

```
sdef erg=1 par=p
```

.

Example geometry with cylinder macrobody

C Cells

```
99 0 1 imp:p=0 $ Outside world
20 0 -1 imp:p=1
```

C Surfaces

C 5 input parameters:

C Surface # Right Circular Cylinder (x,y,z) coordinate of bottom

c (x,y,z) height and directional vector of cone radius

c # RCC x y z $\overrightarrow{(x,y,z)}$ r

```
1 RCC 0 0 0 10 0 0 5 $ bottom of cone at origin, along x axis 10 cm high,
c radius 5
```

C Physics

c we won't focus on this for now

```
mode p
```

```
nps 1000
```

```
sdef erg=1 par=p
```

Example geometry with cylinder macrobody

C Cells

```
99 0 1 imp:p=0 $ Outside world
```

```
20 0 -1 imp:p=1
```

C Surfaces

C 5 input parameters:

C Surface # Right Circular Cylinder (x,y,z) coordinate of bottom

c (x,y,z) height and directional vector of cone radius

c # RCC x y z $\overrightarrow{(x,y,z)}$ r

```
1 RCC 2 3 4 0 35 0 7 $ bottom of cone at (2,3,4), along Z axis 35 cm high,  
c radius 7
```

C Physics

c we won't focus on this for now

```
mode p
```

```
nps 1000
```

```
sdef erg=1 par=p
```

Example geometry with cylinder macrobody

C Cells

```
99 0 1 imp:p=0 $ Outside world
```

```
20 0 -1 imp:p=1
```

C Surfaces

C 5 input parameters:

C Surface # Right Circular Cylinder (x,y,z) coordinate of bottom

c (x,y,z) height and directional vector of cone radius

c # RCC x y z $\overrightarrow{(x,y,z)}$ r

```
1 RCC 0 0 0 0 0 -10 3 $ bottom of cone at origin, pointing down, 10 cm  
c long, radius 3
```

C Physics

c we won't focus on this for now

```
mode p
```

```
nps 1000
```

```
sdef erg=1 par=p
```

Example geometry with cylinder macrobody

C Cells

```
99 0 1 imp:p=0 $ Outside world
```

```
20 0 -1 imp:p=1
```

C Surfaces

C 5 input parameters:

C Surface # Right Circular Cylinder (x,y,z) coordinate of bottom

c (x,y,z) height and directional vector of cone radius

c # RCC x y z $\overrightarrow{(x,y,z)}$ r

```
1 RCC 0 0 0 -3 0 4 1.5 $ bottom of cone at origin, along a NW vector 5 cm  
c high, radius 1.5
```

C Physics

c we won't focus on this for now

```
mode p
```

```
nps 1000
```

```
sdef erg=1 par=p
```

Example geometry with truncated cone

C Cells

```
99 0 1 imp:p=0 $ Outside world
```

```
20 0 -1 imp:p=1 $ cylinder
```

C Surfaces

C 6 input parameters:

C Surface # Truncated right angle cone (x,y,z) coordinate of bottom

c (x,y,z) height and directional vector of cone, radii 1 & 2

c # TRC x y z $\overrightarrow{(x,y,z)}$ r₁ r₂

```
1 TRC 2 3 4 10 0 0 2 5 $ bottom of cone at (2,3,4), along x axis  
C 10 cm high, lower radius 2cm, upper radius 5 cm
```

C Physics

c we won't focus on this for now

```
mode p
```

```
nps 1000
```

```
sdef erg=1 par=p
```

Example geometry with truncated cone

C Cells

99 0 1 imp:p=0 \$ Outside world

20 0 -1 imp:p=1 \$ cylinder

C Surfaces

C 6 input parameters:

C Surface # Truncated right angle cone (x,y,z) coordinate of bottom

c (x,y,z) height and directional vector of cone, radii 1 & 2

c # TRC x y z $\overrightarrow{(x,y,z)}$ r₁ r₂

1 TRC 2 3 4 -10 0 0 2 5 \$ top of cone at (2,3,4), along x axis

C 10 cm high, lower radius 5cm, upper radius 2cm

C Physics

c we won't focus on this for now

mode p

nps 1000

sdef erg=1 par=p

C Surfaces

C 6 input parameters:

C Surface # Truncated right angle cone (x,y,z) coordinate of bottom

c (x,y,z) height and directional vector of cone, radii 1 & 2

c # TRC x y z $\overrightarrow{(x,y,z)}$ r₁ r₂

1 TRC 0 0 0 -3 0 4 1.5 3 \$ top of cone at origin, pointing NW

C 5 cm high, lower radius 3cm, upper radius 1.5cm

C Physics

c we won't focus on this for now

mode p

nps 1000

sdef erg=1 par=p

NESTED Spheres (intro)

Example geometry with nested spheres

C Cells

```
99 0 1 imp:p=0 $ Outside world
```

```
20 0 -1 2 imp:p=1 $ cylinder
```

```
30 0 -2 imp:p=1
```

C Surfaces

```
1 so 5
```

```
2 so 3
```

C Physics

```
c we won't focus on this for now
```

```
mode p
```

```
nps 1000
```

```
sdef erg=1 par=p
```