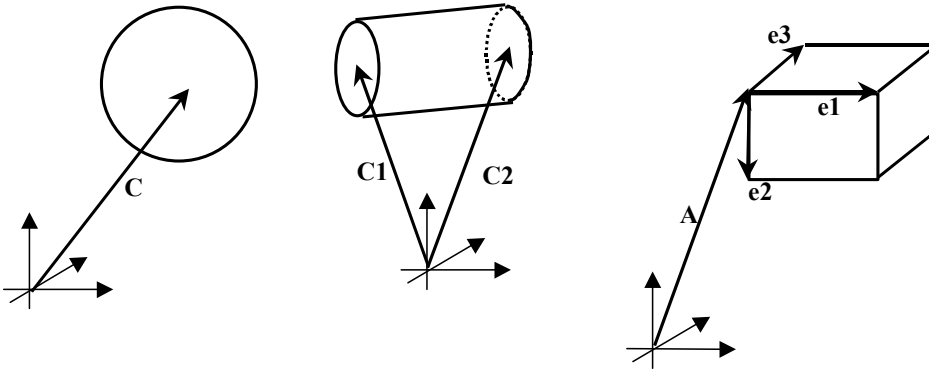


Tutorial 6: Ray Tracing

A solid modelling system uses the following primitives:

Cylinder	C1	C2	r	
Sphere	C	r		
Box	A	e1	e2	e3



The system is to draw the scene in orthographic projection with viewing direction = $[0,0,1]$ (parallel to the z axis).

- 1 Devise a test for each primitive to eliminate simple cases when the ray given by $[x_{pix}, y_{pix}]$ cannot intersect the primitive.
- 2 Use your test on the following data:

Cylinder 1	$[20,50,50]$	$[50,50,50]$	10	
Cylinder 2	$[35,55,40]$	$[35,55,60]$	5	
Sphere 1	$[20,50,50]$	10		
Box 1	$[35,45,40]$	$[15,0,0]$	$[0,15,0]$	$[0,0,20]$
Box 2	$[30,55,40]$	$[5,0,0]$	$[0,-5,0]$	$[0,0,20]$
Ray 1	$[32,52]$			
Ray 2	$[32,58]$			

- 3 What is the surface normal at the point of intersection of the rays given in part 2?
- 4 Devise a suitable test for each primitive for use in perspective projection