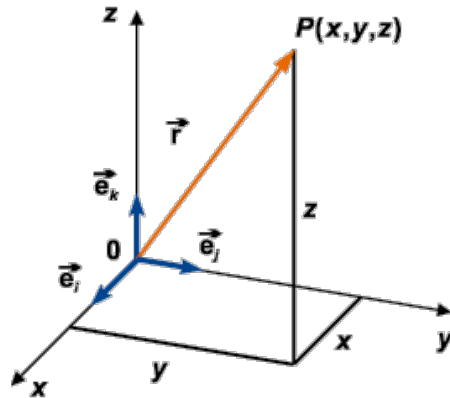# Cartesian Coordinate Systems
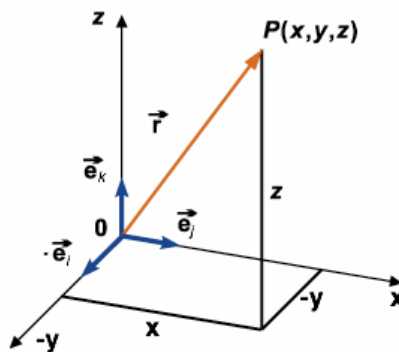
1. Mathematical System: (Navigation)

- right-handed system, y to the front, x to the right, z to the top

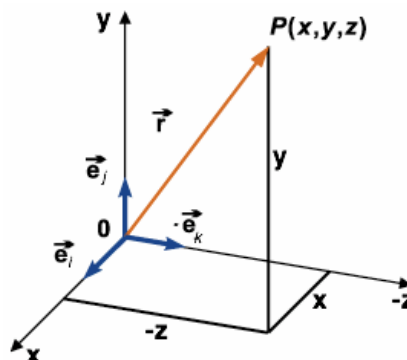adapted from: Bronstein, Semendjajew, Musiol, Muehlig: Taschenbuch der Mathematik

2. Shifted Mathematical System: (Acoustics)

- right-handed system, x to the front, y to the left, z to the top
- Blauert System in cart. coordinates,

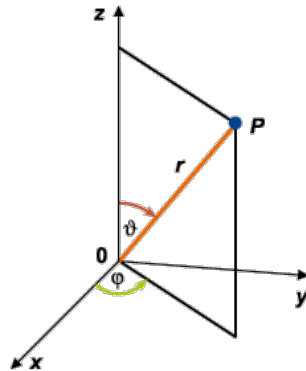### 3. OpenGL, OpenAL System (Computer Graphics)

- right-handend system, x-axis to the right, y-axis to the top, z-axis to the front

Spherical Coordinate Systems
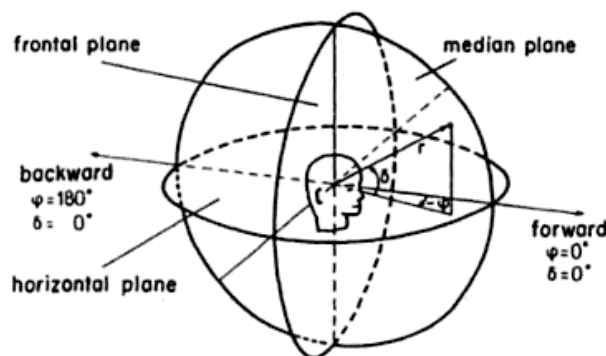
1. Mathematical System:

- azimuth: zero to the right hand-side, counter-clockwise increase
- elevation: angle starts from the positive z-axis

adapted from: Bronstein, Semendjajew, Musiol, Muehlig: Taschenbuch der Mathematik
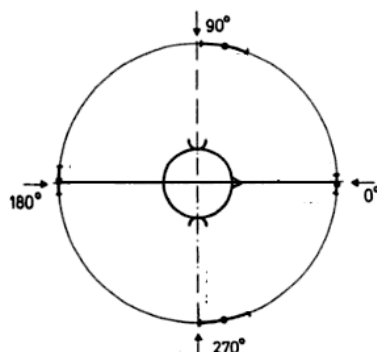
2. Navigational System:

- azimuth: 0 degree in the front, clockwise increase
- elevation: angle is defined between -90.0 (below) and 90.0 degree (above), 0 degree means no elevation

adapted from: Blauert, J. (1997).
Spatial hearing: the psychophysics of human sound localization.
MIT Press, Cambridge, Mass., rev. edition. p. 14

3. Blauert / Gerzon System (Acoustics):

- azimuth: 0 degree in the front, counter-clockwise increase
- elevation: as in Navigational system

adapted from: Blauert, J. (1997).
Spatial hearing: the psychophysics of human sound localization.
MIT Press, Cambridge, Mass., rev. edition. p. 41