



INRAT EXAM FORMULA SHEET

Must Memorize

Flight Planning & Minima

$$\text{Rate of Climb} = \frac{\text{Climb Gradient} \times \text{Ground Speed}}{60}$$

$$\text{Rate Of Descent} = \frac{\text{Groundspeed (kts)} \times 10}{2}$$

OR

$$\text{Rate Of Descent} = \text{Groundspeed (kts)} \times 5$$

Flight Instruments & Navigation

$$\text{Angle of Bank} = \frac{\text{TAS (Knots)}}{10} + 7$$

$$\text{Angle of Bank} = \frac{\text{TAS (MPH)}}{10} + 5$$

$$\text{VOR Range (NM)} = \sqrt[1.23]{\text{Altitude (AGL)}}$$

$$\text{Range (NM)} = 1.23 \times (\sqrt{H_{tx}} + \sqrt{H_{rx}})$$

$$\text{Time to Station} = \frac{\text{Time of Radial Change (s)}}{\# \text{ of Radials}}$$



Flight Instruments & Navigation

$$\text{Distance to Station} = \frac{\text{Groundspeed (kts)} \times \text{Time to Station (Minutes)}}{60}$$

$$MH + RB = MB \text{ (BTS)}$$

$$MB \text{ (BTS)} \pm 180 = BFS$$

$$\text{Time to NDB (Minutes)} = \frac{\text{Time (s) For Bearing Change}}{\text{Degree Of Relative Bearing Change}}$$

$$\text{Distance to NDB (NM)} = \frac{TAS \text{ (kts)} \times \text{Time to NDB (minutes)}}{60}$$

$$\text{Slant Range}^2 = \text{Ground Distance}^2 + \text{Altitude}^2$$

Meteorology

$$\begin{aligned} \text{Density Altitude} \\ = \text{Pressure Altitude} + [120 \times (\text{Actual Temp} - \text{Standard Temp})] \end{aligned}$$

$$\text{Freezing Level} = \frac{\text{Dewpoint Temperature} - \text{Freezing Temperature}}{SALR}$$

$$\text{Base of Cloud} = \frac{\text{Surface Temperature} - \text{Dewpoint Temperature}}{DALR}$$

