1) Altimeter correction for non-standard pressure

'From high to low, look below'
1 mb = 30 feet

FL 270  QNH 977
ISA - 36 mb → 36 x 30 = 1080 feet
Altitude = 25920 feet

2) Altimeter correction for non-standard temperature

'From high to low, look below'
Corr (feet) = 4 x ∆ISA x Altitude (feet) / 1000

FL 300  ISA - 6°C
Corr = 4 x 6 x 30 = 680 feet
Alt = 29320 feet

3) SAT out of TAT

SAT (°C) = TAT (°C) - 3 x Mach

TAT = -17 °C  Mach 0.64
SAT = -17 - 3 x 6 = -17 - 18 = -35 °C

4) SAT out of TAT for higher Mach and lower Temp

SAT (°C) = TAT (°C) - (100 x Mach) - 50

TAT = -31 °C  Mach 0.74
You have 24 above M 0.50
SAT = -31 -24 = -55 °C

5) Level Off procedure if R/C ≤ 1000 feet/min  (also for descent R/D)

∆ feet = R/C (feet/min) / 10

Climbing to FL 210  R/C = 2000 feet/min
∆ feet = 200 feet → start level off at 20800 feet

6) Level Off procedure if R/C > 1000 feet/min  (also for descent R/D)

∆ feet = 2 x R/C (feet/min) / 10

Climbing to FL 300  R/C = 2500 feet/min
∆ feet = 500 feet → start level off at 29500 feet

7) Cruise Flight Level computation

Cruise FL = Trip Distance (NM)

EBBR-EBOS = 60 NM
Optimum is FL 60

8) Vertical Speed to rejoin assigned altitude

V/S (feet/min) = 2 x ∆ feet

If on 6250 feet instead of 6000 feet, correct with V/S = 500 feet/min

9) To obtain TAS out of Mach-number (high altitudes - cruise)

TAS (kt) = 6 x Mach

M 0.72
TAS = 420 kt

10) To find TAS out of IAS and FL

TAS (kt) = IAS (kt) + FL / 2

FL 300  IAS = 240 kt
TAS = 240 + 150 = 390 kt

11) Ground Speed out of Mach

GS (NM/min) = 10 x Mach

M 0.72
GS = 7.2 NM/min
12) Drift computation in cruise

\[
\text{Drift (°) } = \frac{\text{X-wind (kt)}}{\text{Mach}}
\]

M 0.7  X-wind 35 kt  
Drift = 35 / 7 = 5°

13) Drift computation out of TAS  (not IAS, unless during approach)

\[
\text{Drift (°) } = \frac{\text{X-wind (kt)}}{\text{speed number}}
\]

TAS 180 kt  X-wind 36 kt  
Drift = 36 / 3 = 12°

14) To find Ground Speed with DME station available

\[
\text{GS (kt) } = 10 \times \text{distance (NM) in 36s}
\]

Read distance covered in 36 seconds towards or away from station

15) Off-Track distance

\[
\text{Off-Track Distance } = \frac{\triangle \times \text{distance to station}}{60}
\]

9° off track  11 NM from station  
Off-Track Distance = 9 x 11 / 60 = 99 / 60 = 1.6 NM

16) Slant distance overhead a DME – station

\[
\text{each 6000 feet altitude } \rightarrow 1 \text{ NM DME}
\]

Overhead station FL 330  
you will read 33000 / 6000 = 5.5 NM on DME

17) Intercepting outbound leg when close to the VOR-DME station (valid for Mach 0.7)

1 NM for each \( \triangle 30° \)

FL 330  Inbound on R-180 (Hdg N) to track 060 outbound  
Start your turn to 060 at 2 NM before (+ slant 5.5NM)

18) Intercept Heading when passing over station before turning to outbound Heading

\[
\text{Attack (°) } = \frac{1}{3} \times \triangle \text{Track (°)}
\]

Inbound on 180 (Hdg N) to track 060 outbound  
Take Heading 080 overhead Station to intercept Radial

19) Intercept Heading when a little bit off-track

\[
\text{Attack (°) } = 3 \times \text{Off-Track angle (°)}
\]

On R-310 outbound instead of R-315  
Take attack 15° to rejoin

20) Top of Descent  (Idle thrust - 3° descent path)

\[
\text{TOD (NM) } = \frac{\triangle \text{FL}}{3}
\]

FL 280 down to 2000 feet  
TOD = 260 / 3 = 87 NM

21) R/D required to be down at certain point

\[
\text{R/D (feet/min) } = \text{speed number} \times \text{altitude (feet)} \div \text{distance (NM)}
\]

Descent 17000 feet in the next 28 NM  
TAS 240 kt  
R/D = 4 x 17000 / 28 = 2400 feet/min

22) Vertical speed by changing Body Attitude  (valid for high speeds)

\[
\text{R/D (feet/min) } = \text{Mach} \times \Delta \text{BA (°)}
\]

Mach 0.74  \( \rightarrow \) One degree BA results in 740 feet/min

23) Vertical speed by changing Body Attitude  (valid for lower speeds)

Use TAS or IAS in approach

\[
\text{R/D (feet/min) } = \text{speed number} \times \Delta \text{BA (°)}
\]

Speed TAS 420 kt  BA 3 degrees down  
R/D = 7 x 3 = 2100 feet/min
24) Distance required if you want to maintain a certain R/D profile

\[
\text{Distance (NM)} = \frac{\text{speed number x altitude (feet)}}{\text{R/D}}
\]

Descent 23000 feet at 1000 feet/min TAS 300 kt
Distance = 5 x 23 = 115 NM

25) Wind correction for descent distance

\[
\text{Wind Corr (NM)} = 10\% \text{ for each } 40 \text{ kt component}
\]

Example Thumbrule 20) with 20 kts Tailwind
Add 58 to 87 = 92 NM

26) R/D required to follow a certain glide %

\[
\text{R/D (feet/min)} = \text{Ground Speed (kt)} \times \%
\]

TAS 350 kts 20 kts tailwind Glide 3° = 5%
R/D = 370 x 5 = 1850 feet/min

27) Conversion % versus degrees for glide path

\[
\% = \frac{10 \times \text{degrees}}{6}
\]

ILS 3° Glide Slope \(\rightarrow\) 30 / 6 = 5%

28) Start the roll-out from a turn when

\[
\Delta \text{Heading (*) to go} = \frac{\text{Bank (*)}}{3}
\]

Bank 25° Right turn to Hdg 080
Start roll-out 8° in advance, thus on Hdg 072

29) Amount of Bank required for a turn

\[
\text{Bank (*)} = \Delta \text{Heading (*)}
\]

Heading North Right to Heading 007
Take 7° Bank

30) Bank required for a rate one turn

\[
\text{Bank (*)} = 15\% \text{ TAS (kt)}
\]

TAS 180 kt Rate one turn
Bank = 18 + 9 = 27°

31) Turn diameter of a rate one turn

\[
\text{Diameter (NM)} = \frac{\text{TAS (kt)}}{100}
\]

TAS 150 kt
Turn Φ = 1,5 NM

32) Outbound timing for a base turn, when not mentioned on the chart

\[
\text{Time (min)} = \frac{36}{\Delta \text{Track}}
\]

ILS Rwy 27 (QFU 270) Teardrop 066 outbound
Time = 36 / (090-066) = 1,5 min

33) R/D to follow the glide slope ILS 3° = 5%

\[
\text{R/D (feet/min)} = 5 \times \text{Ground Speed (kt)}
\]

On Glide Slope TAS 140 kt 10 kt Tailwind
R/D = 750 feet/min

34) Visibility required to see threshold at VDP (Non-Precision Approach)

\[
\text{Vis (m)} = 6 \times \text{MDA (feet)}
\]

MDA 430 feet
Visibility = 6 x 430 feet = 2500 m

35) Memorize this table 1/60

<table>
<thead>
<tr>
<th>speed (kt)</th>
<th>120</th>
<th>150</th>
<th>180</th>
<th>210</th>
<th>240</th>
<th>270</th>
<th>300</th>
<th>330</th>
</tr>
</thead>
<tbody>
<tr>
<td>speed number</td>
<td>2</td>
<td>2½</td>
<td>3</td>
<td>3½</td>
<td>4</td>
<td>4½</td>
<td>5</td>
<td>5½</td>
</tr>
</tbody>
</table>
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