2.5 Determining the Reference Position (see below for GPS instructions)

0.05 nt mi

Starting line

**4S**

**4P**

Signal Boat

Start Pin

Length (D)

Signal Boat to Reference

Point

Angle (A) to be subtracted from the wind axis to give direction to reference point

Reference Point

|  |  |  |  |
| --- | --- | --- | --- |
| Starting Line | | Length (D) Signal Boat to Reference Point | Angle(A) to subtract from Course Axis. |
| Length (m) | Length (Nt mi) |
| 80 | 0.04 | 0.05 | 23 |
| 90 - 100 | 0.05 | 0.06 | 27 |
| 110 - 120 | 0.06 | 0.06 | 32 |
| 130 | 0.07 | 0.06 | 35 |
| 140 - 150 | 0.08 | 0.06 | 38 |
| 160 - 170 | 0.09 | 0.07 | 42 |
| 180 - 190 | 0.10 | 0.07 | 45 |
| 200 -210 | 0.11 | 0.07 | 48 |
| 220 - 230 | 0.12 | 0.08 | 50 |
| 240 - 250 | 0.13 | 0.08 | 52 |
| 260 | 0.14 | 0.09 | 55 |
| 270 - 280 | 0.15 | 0.09 | 56 |
| 290 - 300 | 0.16 | 0.09 | 57 |

**Gate Marks**

4.1 Gate marks should be set square to the mean wind as measured on a drifting boat.

4.2 The distance between gate marks should be as set out in the table below

|  |  |  |  |
| --- | --- | --- | --- |
| Class | Boat Length  (metres) | Multiplying Factor | Distance  (metres) |
| RS:X Men | 2.86 | 14 | 40 |
| RS:X Women | 2.86 | 14 | 40 |
| Finn | 4.54 | 10 | 50 |
| Laser | 4.24 | 10 | 42 |
| Laser Radial | 4.24 | 10 | 42 |
| 470 Men | 4.7 | 10 | 50 |
| 470 Women | 4.7 | 10 | 50 |
| 49er | 4.9 | 10 | 50 |
| Tornado | 6.09 | 10 | 60 |
| Star | 6.92 | 10 | 70 |
| Yngling | 6.35 | 10 | 65 |

**Starting line**

3.1 The startling line will be set square to the mean wind direction as measured on a drifting boat.

3.2 The starting line will be set 0.05 nm below the 4S/4P gate mark.

3.3 The table on the next page is a guide to the length of the starting line for different classes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Class | Boat Length | Multiplying factor | Number of Boats | Start Line Length  Metres |
| RS:X Men | 2.86 | 2 | 20 | 120 |
| RS:X Women | 2.86 | 2 | 20 | 120 |
| Finn | 4.54 | 1.5 | 20 | 140 |
| Laser | 4.24 | 1.5 | 20 | 130 |
| Laser Radial | 4.24 | 1.5 | 20 | 130 |
| 470 Men | 4.7 | 1.5 | 20 | 140 |
| 470 Women | 4.7 | 1.5 | 20 | 140 |
| 49er | 4.9 | 2 | 20 | 200 |
| Tornado | 6.09 | 2 | 20 | 240 |
| Star | 9.92 | 1.7 | 20 | 340 |
| Yngling | 6.35 | 1.7 | 20 | 220 |

In strong current and higher winds and waves these lengths may need to be increased. When two or more fleets are using the same starting line it may be better to compromise these lengths (some longer and other shorter) to leave the starting line alone rather than delay starts to reset the line at the optimum length.

**Finishing line**

5.1 The finishing line should be the same width as that between the gate marks but for most dinghy fleets a finishing line length of 50 – 60 metres is good.

**Laying the Start Pin Boat for a starting line square to the breeze *- no current***

*Based on 4:1 anchor rode line and distances in* ***metres****. Use the tables to find the “Angle” and “Distance” defined in the diagram below for a given starting line length and depth of water.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Angle*** | | **Line Length (metres)** | | | | | | | | | | | | | | | | | |
| **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **120** | **140** | **160** | **180** | **200** | **220** | **240** | **260** | **280** | **300** |
| Depth (metres) | **5** | 30 | 24 | 19 | 16 | 14 | 12 | 11 | 10 | 8 | 7 | 6 | 6 | 5 | 5 | 4 | 4 | 4 | 3 |
| **10** | 49 | 41 | 35 | 30 | 27 | 24 | 21 | 19 | 16 | 14 | 12 | 11 | 10 | 9 | 8 | 8 | 7 | 7 |
| **15** | 60 | 53 | 46 | 41 | 37 | 33 | 30 | 28 | 24 | 21 | 18 | 16 | 15 | 13 | 12 | 11 | 11 | 10 |
| **20** | 67 | 60 | 54 | 49 | 45 | 41 | 38 | 35 | 30 | 27 | 24 | 21 | 19 | 18 | 16 | 15 | 14 | 13 |
| **25** | 71 | 65 | 60 | 56 | 51 | 48 | 44 | 41 | 36 | 32 | 29 | 26 | 24 | 22 | **20** | 19 | 17 | 16 |
| **30** | 74 | 69 | 65 | 60 | 56 | 53 | 49 | 46 | 41 | 37 | 33 | 30 | 28 | 26 | 24 | 22 | 21 | 19 |
| **35** | 76 | 72 | 68 | 64 | 60 | 57 | 54 | 51 | 46 | 41 | 37 | 34 | 31 | 29 | 27 | 25 | 24 | 22 |
| **40** | 78 | 74 | 70 | 67 | 63 | 60 | 57 | 54 | 49 | 45 | 41 | 38 | 35 | 32 | 30 | 28 | 27 | 25 |
| **45** | 79 | 76 | 72 | 69 | 66 | 63 | 60 | 58 | 53 | 48 | 45 | 41 | 38 | 36 | 33 | 31 | 29 | 28 |
| **50** | 80 | 77 | 74 | 71 | 68 | 65 | 63 | 60 | 56 | 51 | 48 | 44 | 41 | 39 | 36 | 34 | 32 | 30 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ***Distance*** | | **Line Length (metres)** | | | | | | | | | | | | | | | | | |
| **30** | **40** | **50** | **60** | **70** | **80** | **90** | **100** | **120** | **140** | **160** | **180** | **200** | **220** | **240** | **260** | **280** | **300** |
| Depth (metres) | **5** | 35 | 44 | 53 | 63 | 72 | 82 | 92 | 102 | 121 | 141 | 161 | 181 | 201 | 221 | 241 | 261 | 281 | 301 |
| **10** | 46 | 53 | 61 | 69 | 78 | 87 | 97 | 106 | 125 | 144 | 164 | 183 | 203 | 223 | 243 | 262 | 282 | 302 |
| **15** | 60 | 66 | 73 | 80 | 88 | 96 | 104 | 113 | 131 | 150 | 168 | 188 | 207 | 226 | 246 | 265 | 285 | 305 |
| **20** | 76 | 81 | 86 | 92 | 99 | 106 | 114 | 122 | 139 | 157 | 175 | 193 | 212 | 231 | 250 | 269 | 289 | 308 |
| **25** | 93 | 96 | 101 | 106 | 112 | 119 | 126 | 133 | 149 | 165 | 182 | 200 | 218 | 237 | **255** | 274 | 293 | 313 |
| **30** | 109 | 112 | 116 | 121 | 126 | 132 | 138 | 145 | 159 | 175 | 191 | 208 | 226 | 244 | 262 | 280 | 299 | 318 |
| **35** | 126 | 129 | 132 | 136 | 141 | 146 | 152 | 158 | 171 | 186 | 202 | 218 | 235 | 252 | 269 | 287 | 306 | 324 |
| **40** | 143 | 146 | 149 | 152 | 157 | 161 | 166 | 172 | 184 | 198 | 213 | 228 | 244 | 261 | 278 | 295 | 313 | 331 |
| **45** | 160 | 163 | 165 | 169 | 172 | 177 | 181 | 187 | 198 | 211 | 225 | 239 | 255 | 271 | 287 | 304 | 321 | 339 |
| **50** | 178 | 180 | 182 | 185 | 188 | 192 | 197 | 202 | 212 | 224 | 237 | 251 | 266 | 281 | 297 | 313 | 330 | 347 |

Line Length

***Distance***

***Angle***

Wind axis plus 90°

Wind axis plus 90° plus ***Angle***

Wind axis minus 90° plus ***Angle***

Wind axis minus 90°

Example: For a line length of **240** metres in **25** metres of water, the pin boat should place the anchor at an ***Angle*** 20° further upwind of the final position at a ***Distance*** of 255 metres from the anchored signal boat.

**6 Laying the Start Pin Boat for a starting line square to the breeze - no current**

*Based on 4:1 anchor rode line and distances in* ***nautical miles.*** *Use the tables to find the “Angle” and “Distance” defined in the diagram below for a given starting line length and depth of water.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Angle*** | | **Line Length (nautical miles)** | | | | | | | | | | | | | | | | | | |
| **0.02** | **0.03** | **0.04** | **0.05** | **0.06** | **0.07** | **0.08** | **0.09** | **0.10** | **0.11** | **0.12** | **0.13** | **0.14** | **0.15** | **0.16** | **0.17** | **0.18** | **0.19** | |
| Depth (metres) | **5** | 25 | 17 | 13 | 11 | 9 | 8 | 7 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | |
| **10** | 43 | 32 | 25 | 21 | 17 | 15 | 13 | 12 | 11 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | |
| **15** | 55 | 43 | 35 | 30 | 25 | 22 | 20 | 17 | 16 | 14 | 13 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | |
| **20** | 62 | 52 | 43 | 37 | 32 | 28 | 25 | 23 | 21 | 19 | 17 | 16 | 15 | 14 | 13 | 13 | 12 | 11 | |
| **25** | 67 | 58 | 50 | 43 | 38 | 34 | 31 | 28 | 25 | 23 | 21 | **20** | 19 | 17 | 16 | 16 | 15 | 14 | |
| **30** | 71 | 62 | 55 | 49 | 43 | 39 | 35 | 32 | 30 | 27 | 25 | 24 | 22 | 21 | 20 | 18 | 17 | 17 | |
| **35** | 73 | 66 | 59 | 53 | 48 | 43 | 40 | 36 | 33 | 31 | 29 | 27 | 25 | 24 | 22 | 21 | 20 | 19 | |
| **40** | 75 | 68 | 62 | 57 | 52 | 47 | 43 | 40 | 37 | 34 | 32 | 30 | 28 | 27 | 25 | 24 | 23 | 22 | |
| **45** | 77 | 71 | 65 | 60 | 55 | 51 | 47 | 43 | 40 | 38 | 35 | 33 | 31 | 30 | 28 | 27 | 25 | 24 | |
| **50** | 78 | 72 | 67 | 62 | 58 | 53 | 50 | 46 | 43 | 41 | 38 | 36 | 34 | 32 | 31 | 29 | 28 | 26 | |
|  | | | | | | | | | | | | | | | | | | | | |
| ***Distance*** | | **Line Length (nautical miles)** | | | | | | | | | | | | | | | | | | |
| **0.02** | **0.03** | **0.04** | **0.05** | **0.06** | **0.07** | **0.08** | **0.09** | **0.10** | **0.11** | **0.12** | **0.13** | **0.14** | **0.15** | **0.16** | **0.17** | **0.18** | | **0.19** |
| Depth (metres) | **5** | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.10 | 0.11 | 0.12 | 0.13 | 0.14 | 0.15 | 0.16 | 0.17 | 0.18 | | 0.19 |
| **10** | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.10 | 0.11 | 0.12 | 0.13 | 0.14 | 0.15 | 0.16 | 0.17 | 0.18 | | 0.19 |
| **15** | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.08 | 0.09 | 0.10 | 0.11 | 0.12 | 0.13 | 0.14 | 0.15 | 0.16 | 0.17 | 0.18 | | 0.19 |
| **20** | 0.04 | 0.05 | 0.06 | 0.06 | 0.07 | 0.08 | 0.09 | 0.10 | 0.11 | 0.12 | 0.13 | 0.14 | 0.15 | 0.15 | 0.16 | 0.17 | 0.18 | | 0.19 |
| **25** | 0.05 | 0.06 | 0.06 | 0.07 | 0.08 | 0.08 | 0.09 | 0.10 | 0.11 | 0.12 | 0.13 | **0.14** | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 | | 0.20 |
| **30** | 0.06 | 0.06 | 0.07 | 0.08 | 0.08 | 0.09 | 0.10 | 0.11 | 0.11 | 0.12 | 0.13 | 0.14 | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 | | 0.20 |
| **35** | 0.07 | 0.07 | 0.08 | 0.08 | 0.09 | 0.10 | 0.10 | 0.11 | 0.12 | 0.13 | 0.14 | 0.15 | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 | | 0.20 |
| **40** | 0.08 | 0.08 | 0.09 | 0.09 | 0.10 | 0.10 | 0.11 | 0.12 | 0.13 | 0.13 | 0.14 | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 | 0.20 | | 0.20 |
| **45** | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.11 | 0.12 | 0.12 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.18 | 0.19 | 0.20 | | 0.21 |
| **50** | 0.10 | 0.10 | 0.10 | 0.11 | 0.11 | 0.12 | 0.12 | 0.13 | 0.14 | 0.15 | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 | 0.19 | 0.20 | | 0.21 |

Line Length

***Distance***

***Angle***

Wind axis plus 90°

Wind axis plus 90° plus ***Angle***

Wind axis minus 90° plus ***Angle***

Wind axis minus 90°

Example: For a line length of **0.13** nautical miles in **25** metres of water, the pin boat should place the anchor at an ***Angle*** 20° further upwind of the final position at a ***Distance*** of 0.14 nautical miles from the anchored signal boat.

***45°, 90°, 45° Triangular Course***

Start/Finish 0.05 nt mi downwind of mark 3 or Finish 0.05 nt mi upwind of Mark 1 or two thirds the beat length downwind of Mark 2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Axis** | ***Angles in degrees*** | | | | | | | | |  | **Course Axis** | ***Angles in degrees*** | | | | | | | | |
| **Start to 1** | **1** | **3** | **2** | **1** | **2** | **Start** | **Pin** | **3** | **Finish** |  | **Start to 1** | **1** | **3** | **2** | **1** | **2** | **Start** | **Pin** | **3** | **Finish** |
| **3 (3S/3P) to 1** | **to** | **to** | **to** | **to** | **to** | **to** | **to** | **to** | **to** |  | **3 (3S/3P) to 1** | **to** | **to** | **to** | **to** | **to** | **to** | **to** | **to** | **to** |
|  | **3** | **2** | **3** | **2** | **1** | **Pin** | **Start** | **Finish** | **3** |  | **3 to 2** | **3** | **2** | **3** | **2** | **1** | **Pin** | **Start** | **Finish** | **3** |
| **000** | 180 | 315 | 135 | 225 | 045 | 270 | 090 | 252 | 072 |  | **180** | 000 | 135 | 315 | 045 | 225 | 090 | 270 | 072 | 252 |
| **005** | 185 | 320 | 140 | 230 | 050 | 275 | 095 | 257 | 077 |  | **185** | 005 | 140 | 320 | 050 | 230 | 095 | 275 | 077 | 257 |
| **010** | 190 | 325 | 145 | 235 | 055 | 280 | 100 | 262 | 082 |  | **190** | 010 | 145 | 325 | 055 | 235 | 100 | 280 | 082 | 262 |
| **015** | 195 | 330 | 150 | 240 | 060 | 285 | 105 | 267 | 087 |  | **195** | 015 | 150 | 330 | 060 | 240 | 105 | 285 | 087 | 267 |
| **020** | 200 | 335 | 155 | 245 | 065 | 290 | 110 | 272 | 092 |  | **200** | 020 | 155 | 335 | 065 | 245 | 110 | 290 | 092 | 272 |
| **025** | 205 | 340 | 160 | 250 | 070 | 295 | 115 | 277 | 097 |  | **205** | 025 | 160 | 340 | 070 | 250 | 115 | 295 | 097 | 277 |
| **030** | 210 | 345 | 165 | 255 | 075 | 300 | 120 | 282 | 102 |  | **210** | 030 | 165 | 345 | 075 | 255 | 120 | 300 | 102 | 282 |
| **035** | 215 | 350 | 170 | 260 | 080 | 305 | 125 | 287 | 107 |  | **215** | 035 | 170 | 350 | 080 | 260 | 125 | 305 | 107 | 287 |
| **040** | 220 | 355 | 175 | 265 | 085 | 310 | 130 | 292 | 112 |  | **220** | 040 | 175 | 355 | 085 | 265 | 130 | 310 | 112 | 292 |
| **045** | 225 | 000 | 180 | 270 | 090 | 315 | 135 | 297 | 117 |  | **225** | 045 | 180 | 000 | 090 | 270 | 135 | 315 | 117 | 297 |
| **050** | 230 | 005 | 185 | 275 | 095 | 320 | 140 | 302 | 122 |  | **230** | 050 | 185 | 005 | 095 | 275 | 140 | 320 | 122 | 302 |
| **055** | 235 | 010 | 190 | 280 | 100 | 325 | 145 | 307 | 127 |  | **235** | 055 | 190 | 010 | 100 | 280 | 145 | 325 | 127 | 307 |
| **060** | 240 | 015 | 195 | 285 | 105 | 330 | 150 | 312 | 132 |  | **240** | 060 | 195 | 015 | 105 | 285 | 150 | 330 | 132 | 312 |
| **065** | 245 | 020 | 200 | 290 | 110 | 335 | 155 | 317 | 137 |  | **245** | 065 | 200 | 020 | 110 | 290 | 155 | 335 | 137 | 317 |
| **070** | 250 | 025 | 205 | 295 | 115 | 340 | 160 | 322 | 142 |  | **250** | 070 | 205 | 025 | 115 | 295 | 160 | 340 | 142 | 322 |
| **075** | 255 | 030 | 210 | 300 | 120 | 345 | 165 | 327 | 147 |  | **255** | 075 | 210 | 030 | 120 | 300 | 165 | 345 | 147 | 327 |
| **080** | 260 | 035 | 215 | 305 | 125 | 350 | 170 | 332 | 152 |  | **260** | 080 | 215 | 035 | 125 | 305 | 170 | 350 | 152 | 332 |
| **085** | 265 | 040 | 220 | 310 | 130 | 355 | 175 | 337 | 157 |  | **265** | 085 | 220 | 040 | 130 | 310 | 175 | 355 | 157 | 337 |
| **090** | 270 | 045 | 225 | 315 | 135 | 000 | 180 | 342 | 162 |  | **270** | 090 | 225 | 045 | 135 | 315 | 180 | 000 | 162 | 342 |
| **095** | 275 | 050 | 230 | 320 | 140 | 005 | 185 | 347 | 167 |  | **275** | 095 | 230 | 050 | 140 | 320 | 185 | 005 | 167 | 347 |
| **100** | 280 | 055 | 235 | 325 | 145 | 010 | 190 | 352 | 172 |  | **280** | 100 | 235 | 055 | 145 | 325 | 190 | 010 | 172 | 352 |
| **105** | 285 | 060 | 240 | 330 | 150 | 015 | 195 | 357 | 177 |  | **285** | 105 | 240 | 060 | 150 | 330 | 195 | 015 | 177 | 357 |
| **110** | 290 | 065 | 245 | 335 | 155 | 020 | 200 | 002 | 182 |  | **290** | 110 | 245 | 065 | 155 | 335 | 200 | 020 | 182 | 002 |
| **115** | 295 | 070 | 250 | 340 | 160 | 025 | 205 | 007 | 187 |  | **295** | 115 | 250 | 070 | 160 | 340 | 205 | 025 | 187 | 007 |
| **120** | 300 | 075 | 255 | 345 | 165 | 030 | 210 | 012 | 192 |  | **300** | 120 | 255 | 075 | 165 | 345 | 210 | 030 | 192 | 012 |
| **125** | 305 | 080 | 260 | 350 | 170 | 035 | 215 | 017 | 197 |  | **305** | 125 | 260 | 080 | 170 | 350 | 215 | 035 | 197 | 017 |
| **130** | 310 | 085 | 265 | 355 | 175 | 040 | 220 | 022 | 202 |  | **310** | 130 | 265 | 085 | 175 | 355 | 220 | 040 | 202 | 022 |
| **135** | 315 | 090 | 270 | 000 | 180 | 045 | 225 | 027 | 207 |  | **315** | 135 | 270 | 090 | 180 | 000 | 225 | 045 | 207 | 027 |
| **140** | 320 | 095 | 275 | 005 | 185 | 050 | 230 | 032 | 212 |  | **320** | 140 | 275 | 095 | 185 | 005 | 230 | 050 | 212 | 032 |
| **145** | 325 | 100 | 280 | 010 | 190 | 055 | 235 | 037 | 217 |  | **325** | 145 | 280 | 100 | 190 | 010 | 235 | 055 | 217 | 037 |
| **150** | 330 | 105 | 285 | 015 | 195 | 060 | 240 | 042 | 222 |  | **330** | 150 | 285 | 105 | 195 | 015 | 240 | 060 | 222 | 042 |
| **155** | 335 | 110 | 290 | 020 | 200 | 065 | 245 | 047 | 227 |  | **335** | 155 | 290 | 110 | 200 | 020 | 245 | 065 | 227 | 047 |
| **160** | 340 | 115 | 295 | 025 | 205 | 070 | 250 | 052 | 232 |  | **340** | 160 | 295 | 115 | 205 | 025 | 250 | 070 | 232 | 052 |
| **165** | 345 | 120 | 300 | 030 | 210 | 075 | 255 | 057 | 237 |  | **345** | 165 | 300 | 120 | 210 | 030 | 255 | 075 | 237 | 057 |
| **170** | 350 | 125 | 305 | 035 | 215 | 080 | 260 | 062 | 242 |  | **350** | 170 | 305 | 125 | 215 | 035 | 260 | 080 | 242 | 062 |
| **175** | 355 | 130 | 310 | 040 | 220 | 085 | 265 | 067 | 247 |  | **355** | 175 | 310 | 130 | 220 | 040 | 265 | 085 | 247 | 067 |

***45°, 90°, 45° Triangular Course***

Start/Finish 0.05 nt mi downwind of mark 3 or Finish 0.05 nt mi upwind of Mark 1 or two thirds the beat length downwind of Mark 2

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Leg lengths** | | |  | **Course Distances** | | | | | |
| **3 to 1** | **3 to 2** | **1 to 2** |  | **U1** | **U2** | **U3** | **T1** | **T2** | **T3** |
| **1 to 3** | **2 to 3** | **2 to 1** |  |  |  |  |  |  |  |
| **0.50** | 0.35 | 0.35 |  | 1.81 | 2.81 | 4.01 | 2.31 | 3.31 | 4.51 |
| **0.60** | 0.42 | 0.42 |  | 2.15 | 3.35 | 4.80 | 2.75 | 3.95 | 5.40 |
| **0.70** | 0.49 | 0.49 |  | 2.49 | 3.89 | 5.58 | 3.19 | 4.59 | 6.28 |
| **0.80** | 0.57 | 0.57 |  | 2.83 | 4.43 | 6.36 | 3.63 | 5.23 | 7.16 |
| **0.90** | 0.64 | 0.64 |  | 3.17 | 4.97 | 7.15 | 4.07 | 5.87 | 8.05 |
| **1.00** | 0.71 | 0.71 |  | 3.51 | 5.51 | 7.93 | 4.51 | 6.51 | 8.93 |
| **1.10** | 0.78 | 0.78 |  | 3.86 | 6.06 | 8.71 | 4.96 | 7.16 | 9.81 |
| **1.20** | 0.85 | 0.85 |  | 4.20 | 6.60 | 9.49 | 5.40 | 7.80 | 10.69 |
| **1.30** | 0.92 | 0.92 |  | 4.54 | 7.14 | 10.28 | 5.84 | 8.44 | 11.58 |
| **1.40** | 0.99 | 0.99 |  | 4.88 | 7.68 | 11.06 | 6.28 | 9.08 | 12.46 |
| **1.50** | 1.06 | 1.06 |  | 5.22 | 8.22 | 11.84 | 6.72 | 9.72 | 13.34 |
| **1.60** | 1.13 | 1.13 |  | 5.56 | 8.76 | 12.63 | 7.16 | 10.36 | 14.23 |
| **1.70** | 1.20 | 1.20 |  | 5.90 | 9.30 | 13.41 | 7.60 | 11.00 | 15.11 |
| **1.80** | 1.27 | 1.27 |  | 6.25 | 9.85 | 14.19 | 8.05 | 11.65 | 15.99 |
| **1.90** | 1.34 | 1.34 |  | 6.59 | 10.39 | 14.97 | 8.49 | 12.29 | 16.87 |
| **2.00** | 1.41 | 1.41 |  | 6.93 | 10.93 | 15.76 | 8.93 | 12.93 | 17.76 |
| **2.10** | 1.48 | 1.48 |  | 7.27 | 11.47 | 16.54 | 9.37 | 13.57 | 18.64 |
| **2.20** | 1.56 | 1.56 |  | 7.61 | 12.01 | 17.32 | 9.81 | 14.21 | 19.52 |
| **2.30** | 1.63 | 1.63 |  | 7.95 | 12.55 | 18.11 | 10.25 | 14.85 | 20.41 |
| **2.40** | 1.70 | 1.70 |  | 8.29 | 13.09 | 18.89 | 10.69 | 15.49 | 21.29 |
| **2.50** | 1.77 | 1.77 |  | 8.64 | 13.64 | 19.67 | 11.14 | 16.14 | 22.17 |
| **2.60** | 1.84 | 1.84 |  | 8.98 | 14.18 | 20.45 | 11.58 | 16.78 | 23.05 |
| **2.70** | 1.91 | 1.91 |  | 9.32 | 14.72 | 21.24 | 12.02 | 17.42 | 23.94 |
| **2.80** | 1.98 | 1.98 |  | 9.66 | 15.26 | 22.02 | 12.46 | 18.06 | 24.82 |
| **2.90** | 2.05 | 2.05 |  | 10.00 | 15.80 | 22.80 | 12.90 | 18.70 | 25.70 |
| **3.00** | 2.12 | 2.12 |  | 10.34 | 16.34 | 23.59 | 13.34 | 19.34 | 26.59 |

**1**

**2**

**3**

Reference Point for Laying the course

45°

Wind

0.05 nt mi

0.05 nt ni

Finish

sh

U1 Start – 1 – 2 – 3 – Finish (Upwind)

U2 Start – 1 – 2 – 3 – 1 – 3S/3P – Finish (Upwind)

U3 Start – 1 – 2 – 3 – 1 – 3S/3P – 1 – 2 – 3 – Finish (Upwind)

T1 Start – 1 – 2 – 3 – 1 – Finish (Downwind)

T2 Start – 1 – 2 – 3 – 1 – 3S/3P – 1 – Finish (Downwind)

T3 Start – 1 – 2 – 3 –1– 3S/3P –1 – 2 – 3 – 1 – Finish (Downwind)

Start

U1 Start – 1 – 2 – 3 – Finish (Upwind)

U2 Start – 1 – 2 – 3 – 1 – 3S/3P – Finish (Upwind)

U3 Start – 1 – 2 – 3 – 1 – 3S/3P – 1 – 2 – 3 – Finish (Upwind)

T1 Start – 1 – 2 – 3 – 1 – Finish (Downwind)

T2 Start – 1 – 2 – 3 – 1 – 3S/3P – 1 – Finish (Downwind)

T3 Start – 1 – 2 – 3 –1– 3S/3P –1 – 2 – 3 – 1 – Finish (Downwind)

Trapezoid 60°, 120°, 120°, 60° interior angles Start Finish together. Reach = half beat length

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Axis** | Angles in Degrees | | | | | | | |  | **Course Axis** | Angles in Degrees | | | | | | | |
| 4 - 1 | 1 - 4 | 4 - 2 | 2 - 4 | 1 - 2 | 2 - 1 | 4 - 3 | 3 - 4 | Start |  | 4 - 1 | 1 - 4 | 4 - 2 | 2 - 4 | 1 - 2 | 2 - 1 | 4 - 3 | 3 - 4 | Start |
| 3 - 2 | 2 - 3 |  |  |  |  |  |  | Line | 3 - 2 | 2 - 3 |  |  |  |  |  |  | Line |
| **000** | 180 | 330 | 150 | 240 | 060 | 300 | 120 | 270 | **180** | 000 | 150 | 330 | 060 | 240 | 120 | 300 | 090 |
| **005** | 185 | 335 | 155 | 245 | 065 | 305 | 125 | 275 | **185** | 005 | 155 | 335 | 065 | 245 | 125 | 305 | 095 |
| **010** | 190 | 340 | 160 | 250 | 070 | 310 | 130 | 280 | **190** | 010 | 160 | 340 | 070 | 250 | 130 | 310 | 100 |
| **015** | 195 | 345 | 165 | 255 | 075 | 315 | 135 | 285 | **195** | 015 | 165 | 345 | 075 | 255 | 135 | 315 | 105 |
| **020** | 200 | 350 | 170 | 260 | 080 | 320 | 140 | 290 | **200** | 020 | 170 | 350 | 080 | 260 | 140 | 320 | 110 |
| **025** | 205 | 355 | 175 | 265 | 085 | 325 | 145 | 295 | **205** | 025 | 175 | 355 | 085 | 265 | 145 | 325 | 115 |
| **030** | 210 | 000 | 180 | 270 | 090 | 330 | 150 | 300 | **210** | 030 | 180 | 000 | 090 | 270 | 150 | 330 | 120 |
| **035** | 215 | 005 | 185 | 275 | 095 | 335 | 155 | 305 | **215** | 035 | 185 | 005 | 095 | 275 | 155 | 335 | 125 |
| **040** | 220 | 010 | 190 | 280 | 100 | 340 | 160 | 310 | **220** | 040 | 190 | 010 | 100 | 280 | 160 | 340 | 130 |
| **045** | 225 | 015 | 195 | 285 | 105 | 345 | 165 | 315 | **225** | 045 | 195 | 015 | 105 | 285 | 165 | 345 | 135 |
| **050** | 230 | 020 | 200 | 290 | 110 | 350 | 170 | 320 | **230** | 050 | 200 | 020 | 110 | 290 | 170 | 350 | 140 |
| **055** | 235 | 025 | 205 | 295 | 115 | 355 | 175 | 325 | **235** | 055 | 205 | 025 | 115 | 295 | 175 | 355 | 145 |
| **060** | 240 | 030 | 210 | 300 | 120 | 000 | 180 | 330 | **240** | 060 | 210 | 030 | 120 | 300 | 180 | 000 | 150 |
| **065** | 245 | 035 | 215 | 305 | 125 | 005 | 185 | 335 | **245** | 065 | 215 | 035 | 125 | 305 | 185 | 005 | 155 |
| **070** | 250 | 040 | 220 | 310 | 130 | 010 | 190 | 340 | **250** | 070 | 220 | 040 | 130 | 310 | 190 | 010 | 160 |
| **075** | 255 | 045 | 225 | 315 | 135 | 015 | 195 | 345 | **255** | 075 | 225 | 045 | 135 | 315 | 195 | 015 | 165 |
| **080** | 260 | 050 | 230 | 320 | 140 | 020 | 200 | 350 | **260** | 080 | 230 | 050 | 140 | 320 | 200 | 020 | 170 |
| **085** | 265 | 055 | 235 | 325 | 145 | 025 | 205 | 355 | **265** | 085 | 235 | 055 | 145 | 325 | 205 | 025 | 175 |
| **090** | 270 | 060 | 240 | 330 | 150 | 030 | 210 | 000 | **270** | 090 | 240 | 060 | 150 | 330 | 210 | 030 | 180 |
| **095** | 275 | 065 | 245 | 335 | 155 | 035 | 215 | 005 | **275** | 095 | 245 | 065 | 155 | 335 | 215 | 035 | 185 |
| **100** | 280 | 070 | 250 | 340 | 160 | 040 | 220 | 010 | **280** | 100 | 250 | 070 | 160 | 340 | 220 | 040 | 190 |
| **105** | 285 | 075 | 255 | 345 | 165 | 045 | 225 | 015 | **285** | 105 | 255 | 075 | 165 | 345 | 225 | 045 | 195 |
| **110** | 290 | 080 | 260 | 350 | 170 | 050 | 230 | 020 | **290** | 110 | 260 | 080 | 170 | 350 | 230 | 050 | 200 |
| **115** | 295 | 085 | 265 | 355 | 175 | 055 | 235 | 025 | **295** | 115 | 265 | 085 | 175 | 355 | 235 | 055 | 205 |
| **120** | 300 | 090 | 270 | 000 | 180 | 060 | 240 | 030 | **300** | 120 | 270 | 090 | 180 | 000 | 240 | 060 | 210 |
| **125** | 305 | 095 | 275 | 005 | 185 | 065 | 245 | 035 | **305** | 125 | 275 | 095 | 185 | 005 | 245 | 065 | 215 |
| **130** | 310 | 100 | 280 | 010 | 190 | 070 | 250 | 040 | **310** | 130 | 280 | 100 | 190 | 010 | 250 | 070 | 220 |
| **135** | 315 | 105 | 285 | 015 | 195 | 075 | 255 | 045 | **315** | 135 | 285 | 105 | 195 | 015 | 255 | 075 | 225 |
| **140** | 320 | 110 | 290 | 020 | 200 | 080 | 260 | 050 | **320** | 140 | 290 | 110 | 200 | 020 | 260 | 080 | 230 |
| **145** | 325 | 115 | 295 | 025 | 205 | 085 | 265 | 055 | **325** | 145 | 295 | 115 | 205 | 025 | 265 | 085 | 235 |
| **150** | 330 | 120 | 300 | 030 | 210 | 090 | 270 | 060 | **330** | 150 | 300 | 120 | 210 | 030 | 270 | 090 | 240 |
| **155** | 335 | 125 | 305 | 035 | 215 | 095 | 275 | 065 | **335** | 155 | 305 | 125 | 215 | 035 | 275 | 095 | 245 |
| **160** | 340 | 130 | 310 | 040 | 220 | 100 | 280 | 070 | **340** | 160 | 310 | 130 | 220 | 040 | 280 | 100 | 250 |
| **165** | 345 | 135 | 315 | 045 | 225 | 105 | 285 | 075 | **345** | 165 | 315 | 135 | 225 | 045 | 285 | 105 | 255 |
| **170** | 350 | 140 | 320 | 050 | 230 | 110 | 290 | 080 | **350** | 170 | 320 | 140 | 230 | 050 | 290 | 110 | 260 |
| **175** | 355 | 145 | 325 | 055 | 235 | 115 | 295 | 085 | **355** | 175 | 325 | 145 | 235 | 055 | 295 | 115 | 265 |

Trapezoid 60°, 120°, 120°, 60° interior angles Start Finish together. Reach = half beat length

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lengths in Nautical Miles | | | | |  |  |  |  |  |  |  |
| 4-1 | 4-2 | 4-3 | 1-2 | 2-3 |  | Total Course Length in Nautical Miles | | | | | |
| 1-4 | 2-4 | 3-4 | 2-1 | 3-2 |  | I1 | I2 | I3 | O1 | O2 | O3 |
| 0.2 | 0.17 | 0.1 | 0.1 | 0.1 |  | 0.95 | 1.35 | 1.75 | 0.75 | 0.95 | 1.15 |
| 0.3 | 0.26 | 0.15 | 0.15 | 0.15 |  | 1.4 | 2 | 2.6 | 1.1 | 1.4 | 1.7 |
| 0.4 | 0.35 | 0.2 | 0.2 | 0.2 |  | 1.85 | 2.65 | 3.45 | 1.45 | 1.85 | 2.25 |
| 0.5 | 0.43 | 0.25 | 0.25 | 0.25 |  | 2.3 | 3.3 | 4.3 | 1.8 | 2.3 | 2.8 |
| 0.6 | 0.52 | 0.3 | 0.3 | 0.3 |  | 2.75 | 3.95 | 5.15 | 2.15 | 2.75 | 3.35 |
| 0.7 | 0.61 | 0.35 | 0.35 | 0.35 |  | 3.2 | 4.6 | 6 | 2.5 | 3.2 | 3.9 |
| 0.8 | 0.69 | 0.4 | 0.4 | 0.4 |  | 3.65 | 5.25 | 6.85 | 2.85 | 3.65 | 4.45 |
| 0.9 | 0.78 | 0.45 | 0.45 | 0.45 |  | 4.1 | 5.9 | 7.7 | 3.2 | 4.1 | 5 |
| 1 | 0.87 | 0.5 | 0.5 | 0.5 |  | 4.55 | 6.55 | 8.55 | 3.55 | 4.55 | 5.55 |
| 1.1 | 0.95 | 0.55 | 0.55 | 0.55 |  | 5 | 7.2 | 9.4 | 3.9 | 5 | 6.1 |
| 1.2 | 1.04 | 0.6 | 0.6 | 0.6 |  | 5.45 | 7.85 | 10.25 | 4.25 | 5.45 | 6.65 |
| 1.3 | 1.13 | 0.65 | 0.65 | 0.65 |  | 5.9 | 8.5 | 11.1 | 4.6 | 5.9 | 7.2 |
| 1.4 | 1.21 | 0.7 | 0.7 | 0.7 |  | 6.35 | 9.15 | 11.95 | 4.95 | 6.35 | 7.75 |
| 1.5 | 1.3 | 0.75 | 0.75 | 0.75 |  | 6.8 | 9.8 | 12.8 | 5.3 | 6.8 | 8.3 |
| 1.6 | 1.39 | 0.8 | 0.8 | 0.8 |  | 7.25 | 10.45 | 13.65 | 5.65 | 7.25 | 8.85 |
| 1.7 | 1.47 | 0.85 | 0.85 | 0.85 |  | 7.7 | 11.1 | 14.5 | 6 | 7.7 | 9.4 |
| 1.8 | 1.56 | 0.9 | 0.9 | 0.9 |  | 8.15 | 11.75 | 15.35 | 6.35 | 8.15 | 9.95 |
| 1.9 | 1.65 | 0.95 | 0.95 | 0.95 |  | 8.6 | 12.4 | 16.2 | 6.7 | 8.6 | 10.5 |
| 2 | 1.73 | 1 | 1 | 1 |  | 9.05 | 13.05 | 17.05 | 7.05 | 9.05 | 11.05 |
| 2.1 | 1.82 | 1.05 | 1.05 | 1.05 |  | 9.5 | 13.7 | 17.9 | 7.4 | 9.5 | 11.6 |
| 2.2 | 1.91 | 1.1 | 1.1 | 1.1 |  | 9.95 | 14.35 | 18.75 | 7.75 | 9.95 | 12.15 |
| 2.3 | 1.99 | 1.15 | 1.15 | 1.15 |  | 10.4 | 15 | 19.6 | 8.1 | 10.4 | 12.7 |
| 2.4 | 2.08 | 1.2 | 1.2 | 1.2 |  | 10.85 | 15.65 | 20.45 | 8.45 | 10.85 | 13.25 |
| 2.5 | 2.17 | 1.25 | 1.25 | 1.25 |  | 11.3 | 16.3 | 21.3 | 8.8 | 11.3 | 13.8 |
| 2.6 | 2.25 | 1.3 | 1.3 | 1.3 |  | 11.75 | 16.95 | 22.15 | 9.15 | 11.75 | 14.35 |
| 2.7 | 2.34 | 1.35 | 1.35 | 1.35 |  | 12.2 | 17.6 | 23 | 9.5 | 12.2 | 14.9 |
| 2.8 | 2.42 | 1.4 | 1.4 | 1.4 |  | 12.65 | 18.25 | 23.85 | 9.85 | 12.65 | 15.45 |
| 2.9 | 2.51 | 1.45 | 1.45 | 1.45 |  | 13.1 | 18.9 | 24.7 | 10.2 | 13.1 | 16 |
| 3 | 2.6 | 1.5 | 1.5 | 1.5 |  | 13.55 | 19.55 | 25.55 | 10.55 | 13.55 | 16.55 |
|  | | | | | | | | | | | |
| **I1** Start – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | | | |
| **I2** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | | | |
| **I3** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | | | |
| **O1** Start – 1 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | | | |
| **O2** Start – 1 – 2 – 3 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | | | |
| **O3** Start – 1 – 2 – 3 – 2 – 3 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | | | |

1

2

4S

S

4P

3

Start

Finish

Wind

Trapezoid 70°, 110°, 110°, 70° interior angles Start finish together. Reach = half beat length

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Axis** | **Angle in degrees** | | | | | | | |  | **Course Axis** | **Angle in degrees** | | | | | | | |
| **4 - 1** | **1 - 4** | **4 - 2** | **2 - 4** | **1 - 2** | **2 - 1** | **4 - 3** | **3 - 4** | **Start** |  | **4 - 1** | **1 - 4** | **4 - 2** | **2 - 4** | **1 - 2** | **2 - 1** | **4 - 3** | **3 - 4** | **Start** |
| **3 - 2** | **2 - 3** |  |  |  |  |  |  | **Line** | **3 - 2** | **2 - 3** |  |  |  |  |  |  | **Line** |
| **000** | 180 | 330 | 150 | 250 | 070 | 290 | 110 | 270 | **180** | 180 | 150 | 330 | 070 | 250 | 110 | 290 | 090 |
| **005** | 185 | 335 | 155 | 255 | 075 | 295 | 115 | 275 | **185** | 185 | 155 | 335 | 075 | 255 | 115 | 295 | 095 |
| **010** | 190 | 340 | 160 | 260 | 080 | 300 | 120 | 280 | **190** | 190 | 160 | 340 | 080 | 260 | 120 | 300 | 100 |
| **015** | 195 | 345 | 165 | 265 | 085 | 305 | 125 | 285 | **195** | 195 | 165 | 345 | 085 | 265 | 125 | 305 | 105 |
| **020** | 200 | 350 | 170 | 270 | 090 | 310 | 130 | 290 | **200** | 200 | 170 | 350 | 090 | 270 | 130 | 310 | 110 |
| **025** | 205 | 355 | 175 | 275 | 095 | 315 | 135 | 295 | **205** | 205 | 175 | 355 | 095 | 275 | 135 | 315 | 115 |
| **030** | 210 | 000 | 180 | 280 | 100 | 320 | 140 | 300 | **210** | 210 | 180 | 000 | 100 | 280 | 140 | 320 | 120 |
| **035** | 215 | 005 | 185 | 285 | 105 | 325 | 145 | 305 | **215** | 215 | 185 | 005 | 105 | 285 | 145 | 325 | 125 |
| **040** | 220 | 010 | 190 | 290 | 110 | 330 | 150 | 310 | **220** | 220 | 190 | 010 | 110 | 290 | 150 | 330 | 130 |
| **045** | 225 | 015 | 195 | 295 | 115 | 335 | 155 | 315 | **225** | 225 | 195 | 015 | 115 | 295 | 155 | 335 | 135 |
| **050** | 230 | 020 | 200 | 300 | 120 | 340 | 160 | 320 | **230** | 230 | 200 | 020 | 120 | 300 | 160 | 340 | 140 |
| **055** | 235 | 025 | 205 | 305 | 125 | 345 | 165 | 325 | **235** | 235 | 205 | 025 | 125 | 305 | 165 | 345 | 145 |
| **060** | 240 | 030 | 210 | 310 | 130 | 350 | 170 | 330 | **240** | 240 | 210 | 030 | 130 | 310 | 170 | 350 | 150 |
| **065** | 245 | 035 | 215 | 315 | 135 | 355 | 175 | 335 | **245** | 245 | 215 | 035 | 135 | 315 | 175 | 355 | 155 |
| **070** | 250 | 040 | 220 | 320 | 140 | 000 | 180 | 340 | **250** | 250 | 220 | 040 | 140 | 320 | 180 | 000 | 160 |
| **075** | 255 | 045 | 225 | 325 | 145 | 005 | 185 | 345 | **255** | 255 | 225 | 045 | 145 | 325 | 185 | 005 | 165 |
| **080** | 260 | 050 | 230 | 330 | 150 | 010 | 190 | 350 | **260** | 260 | 230 | 050 | 150 | 330 | 190 | 010 | 170 |
| **085** | 265 | 055 | 235 | 335 | 155 | 015 | 195 | 355 | **265** | 265 | 235 | 055 | 155 | 335 | 195 | 015 | 175 |
| **090** | 270 | 060 | 240 | 340 | 160 | 020 | 200 | 000 | **270** | 270 | 240 | 060 | 160 | 340 | 200 | 020 | 180 |
| **095** | 275 | 065 | 245 | 345 | 165 | 025 | 205 | 005 | **275** | 275 | 245 | 065 | 165 | 345 | 205 | 025 | 185 |
| **100** | 280 | 070 | 250 | 350 | 170 | 030 | 210 | 010 | **280** | 280 | 250 | 070 | 170 | 350 | 210 | 030 | 190 |
| **105** | 285 | 075 | 255 | 355 | 175 | 035 | 215 | 015 | **285** | 285 | 255 | 075 | 175 | 355 | 215 | 035 | 195 |
| **110** | 290 | 080 | 260 | 000 | 180 | 040 | 220 | 020 | **290** | 290 | 260 | 080 | 180 | 000 | 220 | 040 | 200 |
| **115** | 295 | 085 | 265 | 005 | 185 | 045 | 225 | 025 | **295** | 295 | 265 | 085 | 185 | 005 | 225 | 045 | 205 |
| **120** | 300 | 090 | 270 | 010 | 190 | 050 | 230 | 030 | **300** | 300 | 270 | 090 | 190 | 010 | 230 | 050 | 210 |
| **125** | 305 | 095 | 275 | 015 | 195 | 055 | 235 | 035 | **305** | 305 | 275 | 095 | 195 | 015 | 235 | 055 | 215 |
| **130** | 310 | 100 | 280 | 020 | 200 | 060 | 240 | 040 | **310** | 310 | 280 | 100 | 200 | 020 | 240 | 060 | 220 |
| **135** | 315 | 105 | 285 | 025 | 205 | 065 | 245 | 045 | **315** | 315 | 285 | 105 | 205 | 025 | 245 | 065 | 225 |
| **140** | 320 | 110 | 290 | 030 | 210 | 070 | 250 | 050 | **320** | 320 | 290 | 110 | 210 | 030 | 250 | 070 | 230 |
| **145** | 325 | 115 | 295 | 035 | 215 | 075 | 255 | 055 | **325** | 325 | 295 | 115 | 215 | 035 | 255 | 075 | 235 |
| **150** | 330 | 120 | 300 | 040 | 220 | 080 | 260 | 060 | **330** | 330 | 300 | 120 | 220 | 040 | 260 | 080 | 240 |
| **155** | 335 | 125 | 305 | 045 | 225 | 085 | 265 | 065 | **335** | 335 | 305 | 125 | 225 | 045 | 265 | 085 | 245 |
| **160** | 340 | 130 | 310 | 050 | 230 | 090 | 270 | 070 | **340** | 340 | 310 | 130 | 230 | 050 | 270 | 090 | 250 |
| **165** | 345 | 135 | 315 | 055 | 235 | 095 | 275 | 075 | **345** | 345 | 315 | 135 | 235 | 055 | 275 | 095 | 255 |
| **170** | 350 | 140 | 320 | 060 | 240 | 100 | 280 | 080 | **350** | 350 | 320 | 140 | 240 | 060 | 280 | 100 | 260 |
| **175** | 355 | 145 | 325 | 065 | 245 | 105 | 285 | 085 | **355** | 355 | 325 | 145 | 245 | 065 | 285 | 105 | 265 |

Trapezoid 70°, 110°, 110°, 70° interior angles Start finish together. Reach = half beat length

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lengths in Nautical Miles | | | | |  |  |  |  |  |  |  |
| 4-1 | 4-2 | 4-3 | 1-2 | 2-3 |  | Total Course Length in Nautical Miles | | | | | |
| 1-4 | 2-4 | 3-4 | 2-1 | 3-2 |  | I1 | I2 | I3 | O1 | O2 | O3 |
| 0.2 | 0.19 | 0.1 | 0.1 | 0.13 |  | 0.98 | 1.38 | 1.78 | 0.84 | 1.1 | 1.36 |
| 0.3 | 0.29 | 0.15 | 0.15 | 0.2 |  | 1.45 | 2.05 | 2.65 | 1.25 | 1.65 | 2.05 |
| 0.4 | 0.38 | 0.2 | 0.2 | 0.26 |  | 1.91 | 2.71 | 3.51 | 1.63 | 2.15 | 2.67 |
| 0.5 | 0.48 | 0.25 | 0.25 | 0.33 |  | 2.38 | 3.38 | 4.38 | 2.04 | 2.7 | 3.36 |
| 0.6 | 0.57 | 0.3 | 0.3 | 0.39 |  | 2.84 | 4.04 | 5.24 | 2.42 | 3.2 | 3.98 |
| 0.7 | 0.67 | 0.35 | 0.35 | 0.46 |  | 3.31 | 4.71 | 6.11 | 2.83 | 3.75 | 4.67 |
| 0.8 | 0.76 | 0.4 | 0.4 | 0.53 |  | 3.78 | 5.38 | 6.98 | 3.24 | 4.3 | 5.36 |
| 0.9 | 0.86 | 0.45 | 0.45 | 0.59 |  | 4.24 | 6.04 | 7.84 | 3.62 | 4.8 | 5.98 |
| 1 | 0.95 | 0.5 | 0.5 | 0.66 |  | 4.71 | 6.71 | 8.71 | 4.03 | 5.35 | 6.67 |
| 1.1 | 1.05 | 0.55 | 0.55 | 0.72 |  | 5.17 | 7.37 | 9.57 | 4.41 | 5.85 | 7.29 |
| 1.2 | 1.14 | 0.6 | 0.6 | 0.79 |  | 5.64 | 8.04 | 10.44 | 4.82 | 6.4 | 7.98 |
| 1.3 | 1.24 | 0.65 | 0.65 | 0.86 |  | 6.11 | 8.71 | 11.31 | 5.23 | 6.95 | 8.67 |
| 1.4 | 1.33 | 0.7 | 0.7 | 0.92 |  | 6.57 | 9.37 | 12.17 | 5.61 | 7.45 | 9.29 |
| 1.5 | 1.43 | 0.75 | 0.75 | 0.99 |  | 7.04 | 10.04 | 13.04 | 6.02 | 8 | 9.98 |
| 1.6 | 1.52 | 0.8 | 0.8 | 1.05 |  | 7.5 | 10.7 | 13.9 | 6.4 | 8.5 | 10.6 |
| 1.7 | 1.62 | 0.85 | 0.85 | 1.12 |  | 7.97 | 11.37 | 14.77 | 6.81 | 9.05 | 11.29 |
| 1.8 | 1.72 | 0.9 | 0.9 | 1.18 |  | 8.43 | 12.03 | 15.63 | 7.19 | 9.55 | 11.91 |
| 1.9 | 1.81 | 0.95 | 0.95 | 1.25 |  | 8.9 | 12.7 | 16.5 | 7.6 | 10.1 | 12.6 |
| 2 | 1.91 | 1 | 1 | 1.32 |  | 9.37 | 13.37 | 17.37 | 8.01 | 10.65 | 13.29 |
| 2.1 | 2 | 1.05 | 1.05 | 1.38 |  | 9.83 | 14.03 | 18.23 | 8.39 | 11.15 | 13.91 |
| 2.2 | 2.1 | 1.1 | 1.1 | 1.45 |  | 10.3 | 14.7 | 19.1 | 8.8 | 11.7 | 14.6 |
| 2.3 | 2.19 | 1.15 | 1.15 | 1.51 |  | 10.76 | 15.36 | 19.96 | 9.18 | 12.2 | 15.22 |
| 2.4 | 2.29 | 1.2 | 1.2 | 1.58 |  | 11.23 | 16.03 | 20.83 | 9.59 | 12.75 | 15.91 |
| 2.5 | 2.38 | 1.25 | 1.25 | 1.64 |  | 11.69 | 16.69 | 21.69 | 9.97 | 13.25 | 16.53 |
| 2.6 | 2.48 | 1.3 | 1.3 | 1.71 |  | 12.16 | 17.36 | 22.56 | 10.38 | 13.8 | 17.22 |
| 2.7 | 2.57 | 1.35 | 1.35 | 1.78 |  | 12.63 | 18.03 | 23.43 | 10.79 | 14.35 | 17.91 |
| 2.8 | 2.67 | 1.4 | 1.4 | 1.84 |  | 13.09 | 18.69 | 24.29 | 11.17 | 14.85 | 18.53 |
| 2.9 | 2.76 | 1.45 | 1.45 | 1.91 |  | 13.56 | 19.36 | 25.16 | 11.58 | 15.4 | 19.22 |
| 3 | 2.86 | 1.5 | 1.5 | 1.97 |  | 14.02 | 20.02 | 26.02 | 11.96 | 15.9 | 19.84 |
|  | | | | | | | | | | | |
| **I1** Start – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | | | |
| **I2** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | | | |
| **I3** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | | | |
| **O1** Start – 1 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | | | |
| **O2** Start – 1 – 2 – 3 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | | | |
| **O3** Start – 1 – 2 – 3 – 2 – 3 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | | | |

1

2

4S

S

4P

3

Start

Finish

Wind

Trapezoid 60°, 120°, 120°, 60° interior angles equal beats. Reach = half beat length

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Axis** | Angles in degrees | | | | | | | |  | **Course Axis** | Angles in degrees | | | | | | | |
| **4 - 1** | **1 - 4** | **4 - 2** | **2 - 4** | **4 - 3** | **3 - 4** | **F - 3** | **3 - F** | **Start** |  | **4 - 1** | **1 - 4** | **4 - 2** | **2 - 4** | **4 - 3** | **3 - 4** | **F - 3** | **3 - F** | **Start** |
| **3 - 2** | **2 - 3** |  |  | **1 - 2** | **2 - 1** |  |  | **Line** | **3 - 2** | **2 - 3** |  |  | **1 - 2** | **2 - 1** |  |  | **Line** |
| **000** | 180 | 330 | 150 | 240 | 060 | 300 | 120 | 270 | **180** | 000 | 150 | 330 | 060 | 240 | 120 | 300 | 090 |
| **005** | 185 | 335 | 155 | 245 | 065 | 305 | 125 | 275 | **185** | 005 | 155 | 335 | 065 | 245 | 125 | 305 | 095 |
| **010** | 190 | 340 | 160 | 250 | 070 | 310 | 130 | 280 | **190** | 010 | 160 | 340 | 070 | 250 | 130 | 310 | 100 |
| **015** | 195 | 345 | 165 | 255 | 075 | 315 | 135 | 285 | **195** | 015 | 165 | 345 | 075 | 255 | 135 | 315 | 105 |
| **020** | 200 | 350 | 170 | 260 | 080 | 320 | 140 | 290 | **200** | 020 | 170 | 350 | 080 | 260 | 140 | 320 | 110 |
| **025** | 205 | 355 | 175 | 265 | 085 | 325 | 145 | 295 | **205** | 025 | 175 | 355 | 085 | 265 | 145 | 325 | 115 |
| **030** | 210 | 000 | 180 | 270 | 090 | 330 | 150 | 300 | **210** | 030 | 180 | 000 | 090 | 270 | 150 | 330 | 120 |
| **035** | 215 | 005 | 185 | 275 | 095 | 335 | 155 | 305 | **215** | 035 | 185 | 005 | 095 | 275 | 155 | 335 | 125 |
| **040** | 220 | 010 | 190 | 280 | 100 | 340 | 160 | 310 | **220** | 040 | 190 | 010 | 100 | 280 | 160 | 340 | 130 |
| **045** | 225 | 015 | 195 | 285 | 105 | 345 | 165 | 315 | **225** | 045 | 195 | 015 | 105 | 285 | 165 | 345 | 135 |
| **050** | 230 | 020 | 200 | 290 | 110 | 350 | 170 | 320 | **230** | 050 | 200 | 020 | 110 | 290 | 170 | 350 | 140 |
| **055** | 235 | 025 | 205 | 295 | 115 | 355 | 175 | 325 | **235** | 055 | 205 | 025 | 115 | 295 | 175 | 355 | 145 |
| **060** | 240 | 030 | 210 | 300 | 120 | 000 | 180 | 330 | **240** | 060 | 210 | 030 | 120 | 300 | 180 | 000 | 150 |
| **065** | 245 | 035 | 215 | 305 | 125 | 005 | 185 | 335 | **245** | 065 | 215 | 035 | 125 | 305 | 185 | 005 | 155 |
| **070** | 250 | 040 | 220 | 310 | 130 | 010 | 190 | 340 | **250** | 070 | 220 | 040 | 130 | 310 | 190 | 010 | 160 |
| **075** | 255 | 045 | 225 | 315 | 135 | 015 | 195 | 345 | **255** | 075 | 225 | 045 | 135 | 315 | 195 | 015 | 165 |
| **080** | 260 | 050 | 230 | 320 | 140 | 020 | 200 | 350 | **260** | 080 | 230 | 050 | 140 | 320 | 200 | 020 | 170 |
| **085** | 265 | 055 | 235 | 325 | 145 | 025 | 205 | 355 | **265** | 085 | 235 | 055 | 145 | 325 | 205 | 025 | 175 |
| **090** | 270 | 060 | 240 | 330 | 150 | 030 | 210 | 000 | **270** | 090 | 240 | 060 | 150 | 330 | 210 | 030 | 180 |
| **095** | 275 | 065 | 245 | 335 | 155 | 035 | 215 | 005 | **275** | 095 | 245 | 065 | 155 | 335 | 215 | 035 | 185 |
| **100** | 280 | 070 | 250 | 340 | 160 | 040 | 220 | 010 | **280** | 100 | 250 | 070 | 160 | 340 | 220 | 040 | 190 |
| **105** | 285 | 075 | 255 | 345 | 165 | 045 | 225 | 015 | **285** | 105 | 255 | 075 | 165 | 345 | 225 | 045 | 195 |
| **110** | 290 | 080 | 260 | 350 | 170 | 050 | 230 | 020 | **290** | 110 | 260 | 080 | 170 | 350 | 230 | 050 | 200 |
| **115** | 295 | 085 | 265 | 355 | 175 | 055 | 235 | 025 | **295** | 115 | 265 | 085 | 175 | 355 | 235 | 055 | 205 |
| **120** | 300 | 090 | 270 | 000 | 180 | 060 | 240 | 030 | **300** | 120 | 270 | 090 | 180 | 000 | 240 | 060 | 210 |
| **125** | 305 | 095 | 275 | 005 | 185 | 065 | 245 | 035 | **305** | 125 | 275 | 095 | 185 | 005 | 245 | 065 | 215 |
| **130** | 310 | 100 | 280 | 010 | 190 | 070 | 250 | 040 | **310** | 130 | 280 | 100 | 190 | 010 | 250 | 070 | 220 |
| **135** | 315 | 105 | 285 | 015 | 195 | 075 | 255 | 045 | **315** | 135 | 285 | 105 | 195 | 015 | 255 | 075 | 225 |
| **140** | 320 | 110 | 290 | 020 | 200 | 080 | 260 | 050 | **320** | 140 | 290 | 110 | 200 | 020 | 260 | 080 | 230 |
| **145** | 325 | 115 | 295 | 025 | 205 | 085 | 265 | 055 | **325** | 145 | 295 | 115 | 205 | 025 | 265 | 085 | 235 |
| **150** | 330 | 120 | 300 | 030 | 210 | 090 | 270 | 060 | **330** | 150 | 300 | 120 | 210 | 030 | 270 | 090 | 240 |
| **155** | 335 | 125 | 305 | 035 | 215 | 095 | 275 | 065 | **335** | 155 | 305 | 125 | 215 | 035 | 275 | 095 | 245 |
| **160** | 340 | 130 | 310 | 040 | 220 | 100 | 280 | 070 | **340** | 160 | 310 | 130 | 220 | 040 | 280 | 100 | 250 |
| **165** | 345 | 135 | 315 | 045 | 225 | 105 | 285 | 075 | **345** | 165 | 315 | 135 | 225 | 045 | 285 | 105 | 255 |
| **170** | 350 | 140 | 320 | 050 | 230 | 110 | 290 | 080 | **350** | 170 | 320 | 140 | 230 | 050 | 290 | 110 | 260 |
| **175** | 355 | 145 | 325 | 055 | 235 | 115 | 295 | 085 | **355** | 175 | 325 | 145 | 235 | 055 | 295 | 115 | 265 |

Trapezoid 60°, 120°, 120°, 60° interior angles equal beats. Reach = half beat length

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lengths in Nautical Miles | | |  |  |  |  |  |  |  |
| **4 - 1** | **4 - 2** | **4 - 3** |  |  |  |  |  |  |  |
| **1 - 4** | **2 - 4** | **3 - 4** |  |  |  |  |  |  |  |
| **2 - 3** |  | **1 - 2** |  | Total Course Length in Nautical Miles | | | | | |
| **3 - 2** |  | **2 - 1** |  | **I1** | **I2** | **I3** | **O1** | **O2** | **O3** |
| **0.3** | 0.26 | 0.15 |  | 1.50 | 2.10 | 2.70 | 1.50 | 2.10 | 2.70 |
| **0.4** | 0.35 | 0.2 |  | 1.95 | 2.75 | 3.55 | 1.95 | 2.75 | 3.55 |
| **0.5** | 0.43 | 0.25 |  | 2.40 | 3.40 | 4.40 | 2.40 | 3.40 | 4.40 |
| **0.6** | 0.52 | 0.3 |  | 2.85 | 4.05 | 5.25 | 2.85 | 4.05 | 5.25 |
| **0.7** | 0.61 | 0.35 |  | 3.30 | 4.70 | 6.10 | 3.30 | 4.70 | 6.10 |
| **0.8** | 0.69 | 0.4 |  | 3.75 | 5.35 | 6.95 | 3.75 | 5.35 | 6.95 |
| **0.9** | 0.78 | 0.45 |  | 4.20 | 6.00 | 7.80 | 4.20 | 6.00 | 7.80 |
| **1** | 0.87 | 0.5 |  | 4.65 | 6.65 | 8.65 | 4.65 | 6.65 | 8.65 |
| **1.1** | 0.95 | 0.55 |  | 5.10 | 7.30 | 9.50 | 5.10 | 7.30 | 9.50 |
| **1.2** | 1.04 | 0.6 |  | 5.55 | 7.95 | 10.35 | 5.55 | 7.95 | 10.35 |
| **1.3** | 1.13 | 0.65 |  | 6.00 | 8.60 | 11.20 | 6.00 | 8.60 | 11.20 |
| **1.4** | 1.21 | 0.7 |  | 6.45 | 9.25 | 12.05 | 6.45 | 9.25 | 12.05 |
| **1.5** | 1.3 | 0.75 |  | 6.90 | 9.90 | 12.90 | 6.90 | 9.90 | 12.90 |
| **1.6** | 1.39 | 0.8 |  | 7.35 | 10.55 | 13.75 | 7.35 | 10.55 | 13.75 |
| **1.7** | 1.47 | 0.85 |  | 7.80 | 11.20 | 14.60 | 7.80 | 11.20 | 14.60 |
| **1.8** | 1.56 | 0.9 |  | 8.25 | 11.85 | 15.45 | 8.25 | 11.85 | 15.45 |
| **1.9** | 1.65 | 0.95 |  | 8.70 | 12.50 | 16.30 | 8.70 | 12.50 | 16.30 |
| **2** | 1.73 | 1 |  | 9.15 | 13.15 | 17.15 | 9.15 | 13.15 | 17.15 |
| **2.1** | 1.82 | 1.05 |  | 9.60 | 13.80 | 18.00 | 9.60 | 13.80 | 18.00 |
| **2.2** | 1.91 | 1.1 |  | 10.05 | 14.45 | 18.85 | 10.05 | 14.45 | 18.85 |
| **2.3** | 1.99 | 1.15 |  | 10.50 | 15.10 | 19.70 | 10.50 | 15.10 | 19.70 |
| **2.4** | 2.08 | 1.2 |  | 10.95 | 15.75 | 20.55 | 10.95 | 15.75 | 20.55 |
| **2.5** | 2.17 | 1.25 |  | 11.40 | 16.40 | 21.40 | 11.40 | 16.40 | 21.40 |
| **2.6** | 2.25 | 1.3 |  | 11.85 | 17.05 | 22.25 | 11.85 | 17.05 | 22.25 |
| **2.7** | 2.34 | 1.35 |  | 12.30 | 17.70 | 23.10 | 12.30 | 17.70 | 23.10 |
| **2.8** | 2.42 | 1.4 |  | 12.75 | 18.35 | 23.95 | 12.75 | 18.35 | 23.95 |
| **2.9** | 2.51 | 1.45 |  | 13.20 | 19.00 | 24.80 | 13.20 | 19.00 | 24.80 |
| **3** | 2.6 | 1.5 |  | 13.65 | 19.65 | 25.65 | 13.65 | 19.65 | 25.65 |
| **I1** Start – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | | |
| **I2** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | | |
| **I3** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | | |
| **O1** Start – 1 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | | |
| **O2** Start – 1 – 2 – 3 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | | |
| **O3** Start – 1 – 2 – 3 – 2 – 3 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | | |

1

2

4S

S

4P

3

Start

Finish

Wind

Lay the finish using the position of Mark 3 as a guide.

0.1 nm

Trapezoid 70°, 110°, 110°, 70° interior angles equal beats. Reach = half beat length

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Axis** | Angles in degrees | | | | | | | |  | **Course Axis** | Angles in degrees | | | | | | | |
| **4-1** | **1-4** | **4-2** | **2-4** | **4-3** | **3-4** | **F-3** | **3-F** | **Start** |  | **4-1** | **1-4** | **4-2** | **2-4** | **4-3** | **3-4** | **F-3** | **3-F** | **Start** |
| **3-2** | **2-3** |  |  | **1-2** | **2-1** |  |  | **Line** | **3-2** | **2-3** |  |  | **1-2** | **2-1** |  |  | **Line** |
| **000** | 180 | 330 | 150 | 250 | 070 | 290 | 110 | 270 | **180** | 000 | 150 | 330 | 070 | 250 | 110 | 290 | 090 |
| **005** | 185 | 335 | 155 | 255 | 075 | 295 | 115 | 275 | **185** | 005 | 155 | 335 | 075 | 255 | 115 | 295 | 095 |
| **010** | 190 | 340 | 160 | 260 | 080 | 300 | 120 | 280 | **190** | 010 | 160 | 340 | 080 | 260 | 120 | 300 | 100 |
| **015** | 195 | 345 | 165 | 265 | 085 | 305 | 125 | 285 | **195** | 015 | 165 | 345 | 085 | 265 | 125 | 305 | 105 |
| **020** | 200 | 350 | 170 | 270 | 090 | 310 | 130 | 290 | **200** | 020 | 170 | 350 | 090 | 270 | 130 | 310 | 110 |
| **025** | 205 | 355 | 175 | 275 | 095 | 315 | 135 | 295 | **205** | 025 | 175 | 355 | 095 | 275 | 135 | 315 | 115 |
| **030** | 210 | 000 | 180 | 280 | 100 | 320 | 140 | 300 | **210** | 030 | 180 | 000 | 100 | 280 | 140 | 320 | 120 |
| **035** | 215 | 005 | 185 | 285 | 105 | 325 | 145 | 305 | **215** | 035 | 185 | 005 | 105 | 285 | 145 | 325 | 125 |
| **040** | 220 | 010 | 190 | 290 | 110 | 330 | 150 | 310 | **220** | 040 | 190 | 010 | 110 | 290 | 150 | 330 | 130 |
| **045** | 225 | 015 | 195 | 295 | 115 | 335 | 155 | 315 | **225** | 045 | 195 | 015 | 115 | 295 | 155 | 335 | 135 |
| **050** | 230 | 020 | 200 | 300 | 120 | 340 | 160 | 320 | **230** | 050 | 200 | 020 | 120 | 300 | 160 | 340 | 140 |
| **055** | 235 | 025 | 205 | 305 | 125 | 345 | 165 | 325 | **235** | 055 | 205 | 025 | 125 | 305 | 165 | 345 | 145 |
| **060** | 240 | 030 | 210 | 310 | 130 | 350 | 170 | 330 | **240** | 060 | 210 | 030 | 130 | 310 | 530 | 350 | 150 |
| **065** | 245 | 035 | 215 | 315 | 135 | 355 | 175 | 335 | **245** | 065 | 215 | 035 | 135 | 315 | 535 | 355 | 155 |
| **070** | 250 | 040 | 220 | 320 | 140 | 000 | 180 | 340 | **250** | 070 | 220 | 040 | 140 | 320 | 180 | 000 | 160 |
| **075** | 255 | 045 | 225 | 325 | 145 | 005 | 185 | 345 | **255** | 075 | 225 | 045 | 145 | 325 | 185 | 005 | 165 |
| **080** | 260 | 050 | 230 | 330 | 150 | 010 | 190 | 350 | **260** | 080 | 230 | 050 | 150 | 330 | 190 | 010 | 170 |
| **085** | 265 | 055 | 235 | 335 | 155 | 015 | 195 | 355 | **265** | 085 | 235 | 055 | 155 | 335 | 195 | 015 | 175 |
| **090** | 270 | 060 | 240 | 340 | 160 | 020 | 200 | 000 | **270** | 090 | 240 | 060 | 160 | 340 | 200 | 020 | 180 |
| **095** | 275 | 065 | 245 | 345 | 165 | 025 | 205 | 005 | **275** | 095 | 245 | 065 | 165 | 345 | 205 | 025 | 185 |
| **100** | 280 | 070 | 250 | 350 | 170 | 030 | 210 | 010 | **280** | 100 | 250 | 070 | 170 | 350 | 210 | 030 | 190 |
| **105** | 285 | 075 | 255 | 355 | 175 | 035 | 215 | 015 | **285** | 105 | 255 | 075 | 175 | 355 | 215 | 035 | 195 |
| **110** | 290 | 080 | 260 | 000 | 180 | 040 | 220 | 020 | **290** | 110 | 260 | 080 | 180 | 360 | 220 | 040 | 200 |
| **115** | 295 | 085 | 265 | 005 | 185 | 045 | 225 | 025 | **295** | 115 | 265 | 085 | 185 | 365 | 225 | 045 | 205 |
| **120** | 300 | 090 | 270 | 010 | 190 | 050 | 230 | 030 | **300** | 120 | 270 | 090 | 190 | 010 | 230 | 050 | 210 |
| **125** | 305 | 095 | 275 | 015 | 195 | 055 | 235 | 035 | **305** | 125 | 275 | 095 | 195 | 015 | 235 | 055 | 215 |
| **130** | 310 | 100 | 280 | 020 | 200 | 060 | 240 | 040 | **310** | 130 | 280 | 100 | 200 | 020 | 240 | 060 | 220 |
| **135** | 315 | 105 | 285 | 025 | 205 | 065 | 245 | 045 | **315** | 135 | 285 | 105 | 205 | 025 | 245 | 065 | 225 |
| **140** | 320 | 110 | 290 | 030 | 210 | 070 | 250 | 050 | **320** | 140 | 290 | 110 | 210 | 030 | 250 | 070 | 230 |
| **145** | 325 | 115 | 295 | 035 | 215 | 075 | 255 | 055 | **325** | 145 | 295 | 115 | 215 | 035 | 255 | 075 | 235 |
| **150** | 330 | 120 | 300 | 040 | 220 | 080 | 260 | 060 | **330** | 150 | 300 | 120 | 220 | 040 | 260 | 080 | 240 |
| **155** | 335 | 125 | 305 | 045 | 225 | 085 | 265 | 065 | **335** | 155 | 305 | 125 | 225 | 045 | 265 | 085 | 245 |
| **160** | 340 | 130 | 310 | 050 | 230 | 090 | 270 | 070 | **340** | 160 | 310 | 130 | 230 | 050 | 270 | 090 | 250 |
| **165** | 345 | 135 | 315 | 055 | 235 | 095 | 275 | 075 | **345** | 165 | 315 | 135 | 235 | 055 | 275 | 095 | 255 |
| **170** | 350 | 140 | 320 | 060 | 240 | 100 | 280 | 080 | **350** | 170 | 320 | 140 | 240 | 060 | 280 | 100 | 260 |
| **175** | 355 | 145 | 325 | 065 | 245 | 105 | 285 | 085 | **355** | 175 | 325 | 145 | 245 | 065 | 285 | 105 | 265 |

Trapezoid 70°, 110°, 110°, 70° interior angles equal beats. Reach = half beat length

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lengths in Nautical Miles | | |  |  |  |  |  |  |  |
| 4-1 | 4-2 | 4-3 |  |  |  |  |  |  |  |
| 1-4 | 2-4 | 3-4 |  |  |  |  |  |  |  |
| 2-3 |  | 1-2 |  | Total Course Length in Nautical Miles | | | | | |
| 3-2 |  | 2-1 |  | I1 | I2 | I3 | O1 | O2 | O3 |
| 0.3 | 0.29 | 0.15 |  | 1.50 | 2.10 | 2.70 | 1.50 | 2.10 | 2.70 |
| 0.4 | 0.38 | 0.2 |  | 1.95 | 2.75 | 3.55 | 1.95 | 2.75 | 3.55 |
| 0.5 | 0.48 | 0.25 |  | 2.40 | 3.40 | 4.40 | 2.40 | 3.40 | 4.40 |
| 0.6 | 0.57 | 0.3 |  | 2.85 | 4.05 | 5.25 | 2.85 | 4.05 | 5.25 |
| 0.7 | 0.67 | 0.35 |  | 3.30 | 4.70 | 6.10 | 3.30 | 4.70 | 6.10 |
| 0.8 | 0.76 | 0.4 |  | 3.75 | 5.35 | 6.95 | 3.75 | 5.35 | 6.95 |
| 0.9 | 0.86 | 0.45 |  | 4.20 | 6.00 | 7.80 | 4.20 | 6.00 | 7.80 |
| 1 | 0.95 | 0.5 |  | 4.65 | 6.65 | 8.65 | 4.65 | 6.65 | 8.65 |
| 1.1 | 1.05 | 0.55 |  | 5.10 | 7.30 | 9.50 | 5.10 | 7.30 | 9.50 |
| 1.2 | 1.14 | 0.6 |  | 5.55 | 7.95 | 10.35 | 5.55 | 7.95 | 10.35 |
| 1.3 | 1.24 | 0.65 |  | 6.00 | 8.60 | 11.20 | 6.00 | 8.60 | 11.20 |
| 1.4 | 1.33 | 0.7 |  | 6.45 | 9.25 | 12.05 | 6.45 | 9.25 | 12.05 |
| 1.5 | 1.43 | 0.75 |  | 6.90 | 9.90 | 12.90 | 6.90 | 9.90 | 12.90 |
| 1.6 | 1.52 | 0.8 |  | 7.35 | 10.55 | 13.75 | 7.35 | 10.55 | 13.75 |
| 1.7 | 1.62 | 0.85 |  | 7.80 | 11.20 | 14.60 | 7.80 | 11.20 | 14.60 |
| 1.8 | 1.72 | 0.9 |  | 8.25 | 11.85 | 15.45 | 8.25 | 11.85 | 15.45 |
| 1.9 | 1.81 | 0.95 |  | 8.70 | 12.50 | 16.30 | 8.70 | 12.50 | 16.30 |
| 2 | 1.91 | 1 |  | 9.15 | 13.15 | 17.15 | 9.15 | 13.15 | 17.15 |
| 2.1 | 2 | 1.05 |  | 9.60 | 13.80 | 18.00 | 9.60 | 13.80 | 18.00 |
| 2.2 | 2.1 | 1.1 |  | 10.05 | 14.45 | 18.85 | 10.05 | 14.45 | 18.85 |
| 2.3 | 2.19 | 1.15 |  | 10.50 | 15.10 | 19.70 | 10.50 | 15.10 | 19.70 |
| 2.4 | 2.29 | 1.2 |  | 10.95 | 15.75 | 20.55 | 10.95 | 15.75 | 20.55 |
| 2.5 | 2.38 | 1.25 |  | 11.40 | 16.40 | 21.40 | 11.40 | 16.40 | 21.40 |
| 2.6 | 2.48 | 1.3 |  | 11.85 | 17.05 | 22.25 | 11.85 | 17.05 | 22.25 |
| 2.7 | 2.57 | 1.35 |  | 12.30 | 17.70 | 23.10 | 12.30 | 17.70 | 23.10 |
| 2.8 | 2.67 | 1.4 |  | 12.75 | 18.35 | 23.95 | 12.75 | 18.35 | 23.95 |
| 2.9 | 2.76 | 1.45 |  | 13.20 | 19.00 | 24.80 | 13.20 | 19.00 | 24.80 |
| 3 | 2.86 | 1.5 |  | 13.65 | 19.65 | 25.65 | 13.65 | 19.65 | 25.65 |
| **I1** Start – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | |
| **I2** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | |
| **I3** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3 – Finish | | | | | | | | | |
| **O1** Start – 1 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | |
| **O2** Start – 1 – 2 – 3 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | |
| **O3** Start – 1 – 2 – 3 – 2 – 3 – 2 – 3 – 2 – 3 – Finish | | | | | | | | | |

1

2

4S

S

4P

3

Start

Finish

Lay the finish using the position of Mark 3 as a guide.

0.1 nm

Wind

Trapezoid Course 60°, 120° interior angles equal beats. Reach = 2/3 beat length

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Axis** | Angles in Degrees | | | | | | | | |  | **Course Axis** | Angles in Degrees | | | | | | | | |
| **4 - 1** | **1 - 4** | **4 - 2** | **2 - 4** | **4 - 3** | **3 - 4** | **Signal** | **Pin -** | **3 -** | **Finish** |  | **4 - 1** | **1 - 4** | **4 - 2** | **2 - 4** | **4 - 3** | **3 - 4** | **Signal** | **Pin -** | **3 -** | **Finish** |
| **3 - 2** | **2 - 3** | **1 - 2** | **2 - 1** | **- Pin** | **Signal** | **Finish** | **- 3** |  | **3 - 2** | **2 - 3** | **1 - 2** | **2 - 1** | **- Pin** | **Signal** | **Finish** | **- 3** |
| **000** | 180 | 319 | 139 | 240 | 060 | 270 | 090 | 120 | 300 |  | **180** | 000 | 139 | 319 | 060 | 240 | 090 | 270 | 300 | 120 |
| **005** | 185 | 324 | 144 | 245 | 065 | 275 | 095 | 125 | 305 |  | **185** | 005 | 144 | 324 | 065 | 245 | 095 | 275 | 305 | 125 |
| **010** | 190 | 329 | 149 | 250 | 070 | 280 | 100 | 130 | 310 |  | **190** | 010 | 149 | 329 | 070 | 250 | 100 | 280 | 310 | 130 |
| **015** | 195 | 334 | 154 | 255 | 075 | 285 | 105 | 135 | 315 |  | **195** | 015 | 154 | 334 | 075 | 255 | 105 | 285 | 315 | 135 |
| **020** | 200 | 339 | 159 | 260 | 080 | 290 | 110 | 140 | 320 |  | **200** | 020 | 159 | 339 | 080 | 260 | 110 | 290 | 320 | 140 |
| **025** | 205 | 344 | 164 | 265 | 085 | 295 | 115 | 145 | 325 |  | **205** | 025 | 164 | 344 | 085 | 265 | 115 | 295 | 325 | 145 |
| **030** | 210 | 349 | 169 | 270 | 090 | 300 | 120 | 150 | 330 |  | **210** | 030 | 169 | 349 | 090 | 270 | 120 | 300 | 330 | 150 |
| **035** | 215 | 354 | 174 | 275 | 095 | 305 | 125 | 155 | 335 |  | **215** | 035 | 174 | 354 | 095 | 275 | 125 | 305 | 335 | 155 |
| **040** | 220 | 359 | 179 | 280 | 100 | 310 | 130 | 160 | 340 |  | **220** | 040 | 179 | 359 | 100 | 280 | 130 | 310 | 340 | 160 |
| **045** | 225 | 004 | 184 | 285 | 105 | 315 | 135 | 165 | 345 |  | **225** | 045 | 184 | 004 | 105 | 285 | 135 | 315 | 345 | 165 |
| **050** | 230 | 009 | 189 | 290 | 110 | 320 | 140 | 170 | 350 |  | **230** | 050 | 189 | 009 | 110 | 290 | 140 | 320 | 350 | 170 |
| **055** | 235 | 014 | 194 | 295 | 115 | 325 | 145 | 175 | 355 |  | **235** | 055 | 194 | 014 | 115 | 295 | 145 | 325 | 355 | 175 |
| **060** | 240 | 019 | 199 | 300 | 120 | 330 | 150 | 180 | 000 |  | **240** | 060 | 199 | 019 | 120 | 300 | 150 | 330 | 000 | 180 |
| **065** | 245 | 024 | 204 | 305 | 125 | 335 | 155 | 185 | 005 |  | **245** | 065 | 204 | 024 | 125 | 305 | 155 | 335 | 005 | 185 |
| **070** | 250 | 029 | 209 | 310 | 130 | 340 | 160 | 190 | 010 |  | **250** | 070 | 209 | 029 | 130 | 310 | 160 | 340 | 010 | 190 |
| **075** | 255 | 034 | 214 | 315 | 135 | 345 | 165 | 195 | 015 |  | **255** | 075 | 214 | 034 | 135 | 315 | 165 | 345 | 015 | 195 |
| **080** | 260 | 039 | 219 | 320 | 140 | 350 | 170 | 200 | 020 |  | **260** | 080 | 219 | 039 | 140 | 320 | 170 | 350 | 020 | 200 |
| **085** | 265 | 044 | 224 | 325 | 145 | 355 | 175 | 205 | 025 |  | **265** | 085 | 224 | 044 | 145 | 325 | 175 | 355 | 025 | 205 |
| **090** | 270 | 049 | 229 | 330 | 150 | 000 | 180 | 210 | 030 |  | **270** | 090 | 229 | 049 | 150 | 330 | 180 | 000 | 030 | 210 |
| **095** | 275 | 054 | 234 | 335 | 155 | 005 | 185 | 215 | 035 |  | **275** | 095 | 234 | 054 | 155 | 335 | 185 | 005 | 035 | 215 |
| **100** | 280 | 059 | 239 | 340 | 160 | 010 | 190 | 220 | 040 |  | **280** | 100 | 239 | 059 | 160 | 340 | 190 | 010 | 040 | 220 |
| **105** | 285 | 064 | 244 | 345 | 165 | 015 | 195 | 225 | 045 |  | **285** | 105 | 244 | 064 | 165 | 345 | 195 | 015 | 045 | 225 |
| **110** | 290 | 069 | 249 | 350 | 170 | 020 | 200 | 230 | 050 |  | **290** | 110 | 249 | 069 | 170 | 350 | 200 | 020 | 050 | 230 |
| **115** | 295 | 074 | 254 | 355 | 175 | 025 | 205 | 235 | 055 |  | **295** | 115 | 254 | 074 | 175 | 355 | 205 | 025 | 055 | 235 |
| **120** | 300 | 079 | 259 | 000 | 180 | 030 | 210 | 240 | 060 |  | **300** | 120 | 259 | 079 | 180 | 360 | 210 | 030 | 060 | 240 |
| **125** | 305 | 084 | 264 | 005 | 185 | 035 | 215 | 245 | 065 |  | **305** | 125 | 264 | 084 | 185 | 365 | 215 | 035 | 065 | 245 |
| **130** | 310 | 089 | 269 | 010 | 190 | 040 | 220 | 250 | 070 |  | **310** | 130 | 269 | 089 | 190 | 370 | 220 | 040 | 070 | 250 |
| **135** | 315 | 094 | 274 | 015 | 195 | 045 | 225 | 255 | 075 |  | **315** | 135 | 274 | 094 | 195 | 375 | 225 | 045 | 075 | 255 |
| **140** | 320 | 099 | 279 | 020 | 200 | 050 | 230 | 260 | 080 |  | **320** | 140 | 279 | 099 | 200 | 380 | 230 | 050 | 080 | 260 |
| **145** | 325 | 104 | 284 | 025 | 205 | 055 | 235 | 265 | 085 |  | **325** | 145 | 284 | 104 | 205 | 385 | 235 | 055 | 085 | 265 |
| **150** | 330 | 109 | 289 | 030 | 210 | 060 | 240 | 270 | 090 |  | **330** | 150 | 289 | 109 | 210 | 390 | 240 | 060 | 090 | 270 |
| **155** | 335 | 114 | 294 | 035 | 215 | 065 | 245 | 275 | 095 |  | **335** | 155 | 294 | 114 | 215 | 395 | 245 | 065 | 095 | 275 |
| **160** | 340 | 119 | 299 | 040 | 220 | 070 | 250 | 280 | 100 |  | **340** | 160 | 299 | 119 | 220 | 400 | 250 | 070 | 100 | 280 |
| **165** | 345 | 124 | 304 | 045 | 225 | 075 | 255 | 285 | 105 |  | **345** | 165 | 304 | 124 | 225 | 405 | 255 | 075 | 105 | 285 |
| **170** | 350 | 129 | 309 | 050 | 230 | 080 | 260 | 290 | 110 |  | **350** | 170 | 309 | 129 | 230 | 410 | 260 | 080 | 110 | 290 |
| **175** | 355 | 134 | 314 | 055 | 235 | 085 | 265 | 295 | 115 |  | **355** | 175 | 314 | 134 | 235 | 415 | 265 | 085 | 115 | 295 |

Trapezoid Course 60°, 120° interior angles equal beats. Reach = 2/3 beat length

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Leg lengths** | | |  | **Course Distances** | | |
| **4 - 1 & 1 - 4** | **4 – 2 & 2 - 4** | **1 - 2 & 2 - 1** |  | **I1** | **I2** | **I3** |
| **2 - 3 & 3 - 2** | **4 - 3 & 3 - 4** |  | **O1** | **O2** | **O3** |
| **0.20** | 0.18 | 0.13 |  | 1.13 | 1.53 | 1.93 |
| **0.25** | 0.22 | 0.17 |  | 1.37 | 1.87 | 2.37 |
| **0.30** | 0.26 | 0.20 |  | 1.06 | 2.20 | 2.80 |
| **0.35** | 0.31 | 0.23 |  | 1.83 | 2.53 | 3.23 |
| **0.40** | 0.35 | 0.27 |  | 2.07 | 2.87 | 3.67 |
| **0.45** | 0.40 | 0.30 |  | 2.30 | 3.20 | 4.10 |
| **0.50** | 0.44 | 0.33 |  | 2.53 | 3.53 | 4.53 |
| **0.55** | 0.48 | 0.37 |  | 2.77 | 3.87 | 4.97 |
| **0.60** | 0.53 | 0.40 |  | 3.00 | 4.20 | 5.40 |
| **0.65** | 0.57 | 0.43 |  | 3.23 | 4.53 | 5.83 |
| **0.70** | 0.62 | 0.47 |  | 3.47 | 4.87 | 6.27 |
| **0.75** | 0.66 | 0.50 |  | 3.70 | 5.20 | 6.70 |
| **0.80** | 0.70 | 0.53 |  | 3.93 | 5.53 | 7.13 |
| **0.85** | 0.75 | 0.57 |  | 4.17 | 5.87 | 7.57 |
| **0.90** | 0.79 | 0.60 |  | 4.40 | 6.20 | 8.00 |
| **0.95** | 0.84 | 0.63 |  | 4.63 | 6.53 | 8.43 |
| **1.00** | 0.88 | 0.67 |  | 4.87 | 6.87 | 8.87 |
| **1.10** | 0.97 | 0.73 |  | 5.33 | 7.53 | 9.73 |
| **1.20** | 1.06 | 0.80 |  | 5.80 | 8.2 | 10.60 |
| **1.30** | 1.14 | 0.87 |  | 6.27 | 8.87 | 11.47 |
| **1.40** | 1.23 | 0.93 |  | 6.73 | 9.53 | 12.33 |
| **1.50** | 1.32 | 1.00 |  | 7.20 | 10.20 | 13.20 |
| **1.60** | 1.41 | 1.07 |  | 7.67 | 10.87 | 14.07 |
| **1.70** | 1.50 | 1.13 |  | 8.13 | 11.53 | 14.93 |
| **1.80** | 1.58 | 1.20 |  | 8.60 | 12.20 | 15.80 |
| **1.90** | 1.67 | 1.27 |  | 9.07 | 12.87 | 16.67 |
| **2.00** | 1.76 | 1.33 |  | 9.53 | 13.53 | 17.53 |

**I1** Start – 1 – 4S/4P – 1 – 2 – 3P – Finish

**I2** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3P – Finish

**I3** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 4S/4P– 1 – 2 – 3P – Finish

**O1** Start – 1 – 2 – 3S/3P – 2 – 3P – Finish

**O2** Start – 1 – 2 – 3S/3P – 2 – 3S/3P – 2 – 3P – Finish

**O3** Start – 1 – 2 – 3S/3P – 2 – 3S/3P – 2 – 3S/3P – 2 – 3P – Finish

**3S**

**1**

**4S**

**4P**

**2**

**3P**

Reference Point for Laying the course

60°

Wind

Start

41°

Finish

sh

Trapezoid Course 70°, 110° interior angles. Reach = 2/3 beat length

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Axis** | Angles in Degrees | | | | | | | | |  | **Course Axis** | Angles in Degrees | | | | | | | | |
| **4 - 1** | **1 - 4** | **4 - 2** | **2 - 4** | **4 - 3** | **3 - 4** | **Signal** | **Pin -** | **3 -** | **Finish** |  | **4 - 1** | **1 - 4** | **4 - 2** | **2 - 4** | **4 - 3** | **3 - 4** | **Signal** | **Pin -** | **3 -** | **Finish** |
| **3 - 2** | **2 - 3** | **1 - 2** | **2 - 1** | **- Pin** | **Signal** | **Finish** | **- 3** |  | **3 - 2** | **2 - 3** | **1 - 2** | **2 - 1** | **- Pin** | **Signal** | **Finish** | **- 3** |
| **000** | 180 | 321 | 141 | 250 | 070 | 270 | 090 | 110 | 290 |  | **180** | 360 | 141 | 321 | 070 | 250 | 090 | 270 | 290 | 110 |
| **005** | 185 | 326 | 146 | 255 | 075 | 275 | 095 | 115 | 295 |  | **185** | 005 | 146 | 326 | 075 | 255 | 095 | 275 | 295 | 115 |
| **010** | 190 | 331 | 151 | 260 | 080 | 280 | 100 | 120 | 300 |  | **190** | 010 | 151 | 331 | 080 | 260 | 100 | 280 | 300 | 120 |
| **015** | 195 | 336 | 156 | 265 | 085 | 285 | 105 | 125 | 305 |  | **195** | 015 | 156 | 336 | 085 | 265 | 105 | 285 | 305 | 125 |
| **020** | 200 | 341 | 161 | 270 | 090 | 290 | 110 | 130 | 310 |  | **200** | 020 | 161 | 341 | 090 | 270 | 110 | 290 | 310 | 130 |
| **025** | 205 | 346 | 166 | 275 | 095 | 295 | 115 | 135 | 315 |  | **205** | 025 | 166 | 346 | 095 | 275 | 115 | 295 | 315 | 135 |
| **030** | 210 | 351 | 171 | 280 | 100 | 300 | 120 | 140 | 320 |  | **210** | 030 | 171 | 351 | 100 | 280 | 120 | 300 | 320 | 140 |
| **035** | 215 | 356 | 176 | 285 | 105 | 305 | 125 | 145 | 325 |  | **215** | 035 | 176 | 356 | 105 | 285 | 125 | 305 | 325 | 145 |
| **040** | 220 | 001 | 181 | 290 | 110 | 310 | 130 | 150 | 330 |  | **220** | 040 | 181 | 001 | 110 | 290 | 130 | 310 | 330 | 150 |
| **045** | 225 | 006 | 186 | 295 | 115 | 315 | 135 | 155 | 335 |  | **225** | 045 | 186 | 006 | 115 | 295 | 135 | 315 | 335 | 155 |
| **050** | 230 | 011 | 191 | 300 | 120 | 320 | 140 | 160 | 340 |  | **230** | 050 | 191 | 011 | 120 | 300 | 140 | 320 | 340 | 160 |
| **055** | 235 | 016 | 196 | 305 | 125 | 325 | 145 | 165 | 345 |  | **235** | 055 | 196 | 016 | 125 | 305 | 145 | 325 | 345 | 165 |
| **060** | 240 | 021 | 201 | 310 | 130 | 330 | 150 | 170 | 350 |  | **240** | 060 | 201 | 021 | 130 | 310 | 150 | 330 | 350 | 170 |
| **065** | 245 | 026 | 206 | 315 | 135 | 335 | 155 | 175 | 355 |  | **245** | 065 | 206 | 026 | 135 | 315 | 155 | 335 | 355 | 175 |
| **070** | 250 | 031 | 211 | 320 | 140 | 340 | 160 | 180 | 000 |  | **250** | 070 | 211 | 031 | 140 | 320 | 160 | 340 | 000 | 180 |
| **075** | 255 | 036 | 216 | 325 | 145 | 345 | 165 | 185 | 005 |  | **255** | 075 | 216 | 036 | 145 | 325 | 165 | 345 | 005 | 185 |
| **080** | 260 | 041 | 221 | 330 | 150 | 350 | 170 | 190 | 010 |  | **260** | 080 | 221 | 041 | 150 | 330 | 170 | 350 | 010 | 190 |
| **085** | 265 | 046 | 226 | 335 | 155 | 355 | 175 | 195 | 015 |  | **265** | 085 | 226 | 046 | 155 | 335 | 175 | 355 | 015 | 195 |
| **090** | 270 | 051 | 231 | 340 | 160 | 000 | 180 | 200 | 020 |  | **270** | 090 | 231 | 051 | 160 | 340 | 180 | 000 | 020 | 200 |
| **095** | 275 | 056 | 236 | 345 | 165 | 005 | 185 | 205 | 025 |  | **275** | 095 | 236 | 056 | 165 | 345 | 185 | 005 | 025 | 205 |
| **100** | 280 | 061 | 241 | 350 | 170 | 010 | 190 | 210 | 030 |  | **280** | 100 | 241 | 061 | 170 | 350 | 190 | 010 | 030 | 210 |
| **105** | 285 | 066 | 246 | 355 | 175 | 015 | 195 | 215 | 035 |  | **285** | 105 | 246 | 066 | 175 | 355 | 195 | 015 | 035 | 215 |
| **110** | 290 | 071 | 251 | 000 | 180 | 020 | 200 | 220 | 040 |  | **290** | 110 | 251 | 071 | 180 | 000 | 200 | 020 | 040 | 220 |
| **115** | 295 | 076 | 256 | 005 | 185 | 025 | 205 | 225 | 045 |  | **295** | 115 | 256 | 076 | 185 | 005 | 205 | 025 | 045 | 225 |
| **120** | 300 | 081 | 261 | 010 | 190 | 030 | 210 | 230 | 050 |  | **300** | 120 | 261 | 081 | 190 | 010 | 210 | 030 | 050 | 230 |
| **125** | 305 | 086 | 266 | 015 | 195 | 035 | 215 | 235 | 055 |  | **305** | 125 | 266 | 086 | 195 | 015 | 215 | 035 | 055 | 235 |
| **130** | 310 | 091 | 271 | 020 | 200 | 040 | 220 | 240 | 060 |  | **310** | 130 | 271 | 091 | 200 | 020 | 220 | 040 | 060 | 240 |
| **135** | 315 | 096 | 276 | 025 | 205 | 045 | 225 | 245 | 065 |  | **315** | 135 | 276 | 096 | 205 | 025 | 225 | 045 | 065 | 245 |
| **140** | 320 | 101 | 281 | 030 | 210 | 050 | 230 | 250 | 070 |  | **320** | 140 | 281 | 101 | 210 | 030 | 230 | 050 | 070 | 250 |
| **145** | 325 | 106 | 286 | 035 | 215 | 055 | 235 | 255 | 075 |  | **325** | 145 | 286 | 106 | 215 | 035 | 235 | 055 | 075 | 255 |
| **150** | 330 | 111 | 291 | 040 | 220 | 060 | 240 | 260 | 080 |  | **330** | 150 | 291 | 111 | 220 | 040 | 240 | 060 | 080 | 260 |
| **155** | 335 | 116 | 296 | 045 | 225 | 065 | 245 | 265 | 085 |  | **335** | 155 | 296 | 116 | 225 | 045 | 245 | 065 | 085 | 265 |
| **160** | 340 | 121 | 301 | 050 | 230 | 070 | 250 | 270 | 090 |  | **340** | 160 | 301 | 121 | 230 | 050 | 250 | 070 | 090 | 270 |
| **165** | 345 | 126 | 306 | 055 | 235 | 075 | 255 | 275 | 095 |  | **345** | 165 | 306 | 126 | 235 | 055 | 255 | 075 | 095 | 275 |
| **170** | 350 | 131 | 311 | 060 | 240 | 080 | 260 | 280 | 100 |  | **350** | 170 | 311 | 131 | 240 | 060 | 260 | 080 | 100 | 280 |
| **175** | 355 | 136 | 316 | 065 | 245 | 085 | 265 | 285 | 105 |  | **355** | 175 | 316 | 136 | 245 | 065 | 265 | 085 | 105 | 285 |

Trapezoid Course 70°, 110° interior angles. Reach = 2/3 beat length

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Leg lengths** | | |  | **Course Distances** | | |
| **4 - 1 & 1 - 4** | **4 - 2 & 2 - 4** | **1 - 2 & 2 - 1** |  | **I1** | **I2** | **I3** |
| **2 - 3 & 3 - 2** | **4 - 3 & 3 - 4** |  | **O1** | **O2** | **O3** |
| **0.20** | 0.20 | 0.13 |  | 1.13 | 1.53 | 1.93 |
| **0.25** | 0.25 | 0.17 |  | 1.37 | 1.87 | 2.37 |
| **0.30** | 0.30 | 0.20 |  | 1.60 | 2.20 | 2.80 |
| **0.35** | 0.35 | 0.23 |  | 1.83 | 2.53 | 3.23 |
| **0.40** | 0.40 | 0.27 |  | 2.07 | 2.87 | 3.67 |
| **0.45** | 0.45 | 0.30 |  | 2.30 | 3.20 | 4.10 |
| **0.50** | 0.50 | 0.33 |  | 2.53 | 3.53 | 4.53 |
| **0.55** | 0.55 | 0.37 |  | 2.77 | 3.87 | 4.97 |
| **0.60** | 0.60 | 0.40 |  | 3.00 | 4.20 | 5.40 |
| **0.65** | 0.65 | 0.43 |  | 3.23 | 4.53 | 5.83 |
| **0.70** | 0.70 | 0.47 |  | 3.47 | 4.87 | 6.27 |
| **0.75** | 0.75 | 0.50 |  | 3.70 | 5.20 | 6.70 |
| **0.80** | 0.80 | 0.53 |  | 3.93 | 5.53 | 7.13 |
| **0.85** | 0.85 | 0.57 |  | 4.17 | 5.87 | 7.57 |
| **0.90** | 0.89 | 0.60 |  | 4.40 | 6.20 | 8.00 |
| **0.95** | 0.94 | 0.63 |  | 4.63 | 6.53 | 8.43 |
| **1.00** | 0.99 | 0.67 |  | 4.87 | 6.87 | 8.87 |
| **1.10** | 1.09 | 0.73 |  | 5.33 | 7.53 | 9.73 |
| **1.20** | 1.19 | 0.80 |  | 5.80 | 8.20 | 10.60 |
| **1.30** | 1.29 | 0.87 |  | 6.27 | 8.87 | 11.47 |
| **1.40** | 1.39 | 0.93 |  | 6.73 | 9.53 | 12.33 |
| **1.50** | 1.49 | 1.00 |  | 7.20 | 10.20 | 13.20 |
| **1.60** | 1.59 | 1.07 |  | 7.67 | 10.87 | 14.07 |
| **1.70** | 1.69 | 1.13 |  | 8.13 | 11.53 | 14.93 |
| **1.80** | 1.79 | 1.20 |  | 8.60 | 12.20 | 15.80 |
| **1.90** | 1.89 | 1.27 |  | 9.07 | 12.87 | 16.67 |
| **2.00** | 1.99 | 1.33 |  | 9.53 | 13.53 | 17.53 |

**I1** Start – 1 – 4S/4P – 1 – 2 – 3P – Finish

**I2** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 2 – 3P – Finish

**I3** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 4S/4P– 1 – 2 – 3P – Finish

**O1** Start – 1 – 2 – 3S/3P – 2 – 3P – Finish

**O2** Start – 1 – 2 – 3S/3P – 2 – 3S/3P – 2 –3P – Finish

**O3** Start – 1 – 2 – 3S/3P – 2 – 3S/3P – 2 – 3S/3P – 2 – 3P – Finish

**3S**

**1**

**4S**

**2**

**3P**

Reference Point for Laying the course

70°

Wind

Start

**4P**

Finish

39°

Laser and Laser Radial Trapezoid Course 70°, 110° interior angles

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Axis** | ***Trapezoid Course 70, 110 interior angles*** | | | | | | | | |  | **Course Axis** |  | | | | | | | | |
| **4 - 1**  **3 - 2**  **5 - F** | **1 – 4**  **2 – 3**  **F - 5** | **4 – 2** | **2 – 4** | **4 – 3**  **1 – 2** | **3 – 4**  **2 – 1** | **3 – 5** | **5 – 3** | **Signal**  **– Pin** | **Pin –**  **Signal** |  | **4 - 1**  **3 - 2**  **5 - F** | **1 – 4**  **2 – 3**  **F - 5** | **4 – 2** | **2 – 4** | **4 – 3**  **1 – 2** | **3 – 4**  **2 – 1** | **3 – 5** | **5 – 3** | **Signal**  **– Pin** | **Pin –**  **Signal** |
| **000** | 180 | 321 | 141 | 250 | 070 | 110 | 290 | 270 | 090 |  | **180** | 360 | 141 | 321 | 070 | 250 | 290 | 110 | 090 | 270 |
| **005** | 185 | 326 | 146 | 255 | 075 | 115 | 295 | 275 | 095 |  | **185** | 005 | 146 | 326 | 075 | 255 | 295 | 115 | 095 | 275 |
| **010** | 190 | 331 | 151 | 260 | 080 | 120 | 300 | 280 | 100 |  | **190** | 010 | 151 | 331 | 080 | 260 | 300 | 120 | 100 | 280 |
| **015** | 195 | 336 | 156 | 265 | 085 | 125 | 305 | 285 | 105 |  | **195** | 015 | 156 | 336 | 085 | 265 | 305 | 125 | 105 | 285 |
| **020** | 200 | 341 | 161 | 270 | 090 | 130 | 310 | 290 | 110 |  | **200** | 020 | 161 | 341 | 090 | 270 | 310 | 130 | 110 | 290 |
| **025** | 205 | 346 | 166 | 275 | 095 | 135 | 315 | 295 | 115 |  | **205** | 025 | 166 | 346 | 095 | 275 | 315 | 135 | 115 | 295 |
| **030** | 210 | 351 | 171 | 280 | 100 | 140 | 320 | 300 | 120 |  | **210** | 030 | 171 | 351 | 100 | 280 | 320 | 140 | 120 | 300 |
| **035** | 215 | 356 | 176 | 285 | 105 | 145 | 325 | 305 | 125 |  | **215** | 035 | 176 | 356 | 105 | 285 | 325 | 145 | 125 | 305 |
| **040** | 220 | 001 | 181 | 290 | 110 | 150 | 330 | 310 | 130 |  | **220** | 040 | 181 | 001 | 110 | 290 | 330 | 150 | 130 | 310 |
| **045** | 225 | 006 | 186 | 295 | 115 | 155 | 335 | 315 | 135 |  | **225** | 045 | 186 | 006 | 115 | 295 | 335 | 155 | 135 | 315 |
| **050** | 230 | 011 | 191 | 300 | 120 | 160 | 340 | 320 | 140 |  | **230** | 050 | 191 | 011 | 120 | 300 | 340 | 160 | 140 | 320 |
| **055** | 235 | 016 | 196 | 305 | 125 | 165 | 345 | 325 | 145 |  | **235** | 055 | 196 | 016 | 125 | 305 | 345 | 165 | 145 | 325 |
| **060** | 240 | 021 | 201 | 310 | 130 | 170 | 350 | 330 | 150 |  | **240** | 060 | 201 | 021 | 130 | 310 | 350 | 170 | 150 | 330 |
| **065** | 245 | 026 | 206 | 315 | 135 | 175 | 355 | 335 | 155 |  | **245** | 065 | 206 | 026 | 135 | 315 | 355 | 175 | 155 | 335 |
| **070** | 250 | 031 | 211 | 320 | 140 | 180 | 000 | 340 | 160 |  | **250** | 070 | 211 | 031 | 140 | 320 | 000 | 180 | 160 | 340 |
| **075** | 255 | 036 | 216 | 325 | 145 | 185 | 005 | 345 | 165 |  | **255** | 075 | 216 | 036 | 145 | 325 | 005 | 185 | 165 | 345 |
| **080** | 260 | 041 | 221 | 330 | 150 | 190 | 010 | 350 | 170 |  | **260** | 080 | 221 | 041 | 150 | 330 | 010 | 190 | 170 | 350 |
| **085** | 265 | 046 | 226 | 335 | 155 | 195 | 015 | 355 | 175 |  | **265** | 085 | 226 | 046 | 155 | 335 | 015 | 195 | 175 | 355 |
| **090** | 270 | 051 | 231 | 340 | 160 | 200 | 020 | 000 | 180 |  | **270** | 090 | 231 | 051 | 160 | 340 | 020 | 200 | 180 | 000 |
| **095** | 275 | 056 | 236 | 345 | 165 | 205 | 025 | 005 | 185 |  | **275** | 095 | 236 | 056 | 165 | 345 | 025 | 205 | 185 | 005 |
| **100** | 280 | 061 | 241 | 350 | 170 | 210 | 030 | 010 | 190 |  | **280** | 100 | 241 | 061 | 170 | 350 | 030 | 210 | 190 | 010 |
| **105** | 285 | 066 | 246 | 355 | 175 | 215 | 035 | 015 | 195 |  | **285** | 105 | 246 | 066 | 175 | 355 | 035 | 215 | 195 | 015 |
| **110** | 290 | 071 | 251 | 000 | 180 | 220 | 040 | 020 | 200 |  | **290** | 110 | 251 | 071 | 180 | 000 | 040 | 220 | 200 | 020 |
| **115** | 295 | 076 | 256 | 005 | 185 | 225 | 045 | 025 | 205 |  | **295** | 115 | 256 | 076 | 185 | 005 | 045 | 225 | 205 | 025 |
| **120** | 300 | 081 | 261 | 010 | 190 | 230 | 050 | 030 | 210 |  | **300** | 120 | 261 | 081 | 190 | 010 | 050 | 230 | 210 | 030 |
| **125** | 305 | 086 | 266 | 015 | 195 | 235 | 055 | 035 | 215 |  | **305** | 125 | 266 | 086 | 195 | 015 | 055 | 235 | 215 | 035 |
| **130** | 310 | 091 | 271 | 020 | 200 | 240 | 060 | 040 | 220 |  | **310** | 130 | 271 | 091 | 200 | 020 | 060 | 240 | 220 | 040 |
| **135** | 315 | 096 | 276 | 025 | 205 | 245 | 065 | 045 | 225 |  | **315** | 135 | 276 | 096 | 205 | 025 | 065 | 245 | 225 | 045 |
| **140** | 320 | 101 | 281 | 030 | 210 | 250 | 070 | 050 | 230 |  | **320** | 140 | 281 | 101 | 210 | 030 | 070 | 250 | 230 | 050 |
| **145** | 325 | 106 | 286 | 035 | 215 | 255 | 075 | 055 | 235 |  | **325** | 145 | 286 | 106 | 215 | 035 | 075 | 255 | 235 | 055 |
| **150** | 330 | 111 | 291 | 040 | 220 | 260 | 080 | 060 | 240 |  | **330** | 150 | 291 | 111 | 220 | 040 | 080 | 260 | 240 | 060 |
| **155** | 335 | 116 | 296 | 045 | 225 | 265 | 085 | 065 | 245 |  | **335** | 155 | 296 | 116 | 225 | 045 | 085 | 265 | 245 | 065 |
| **160** | 340 | 121 | 301 | 050 | 230 | 270 | 090 | 070 | 250 |  | **340** | 160 | 301 | 121 | 230 | 050 | 090 | 270 | 250 | 070 |
| **165** | 345 | 126 | 306 | 055 | 235 | 275 | 095 | 075 | 255 |  | **345** | 165 | 306 | 126 | 235 | 055 | 095 | 275 | 255 | 075 |
| **170** | 350 | 131 | 311 | 060 | 240 | 280 | 100 | 080 | 260 |  | **350** | 170 | 311 | 131 | 240 | 060 | 100 | 280 | 260 | 080 |
| **175** | 355 | 136 | 316 | 065 | 245 | 285 | 105 | 085 | 265 |  | **355** | 175 | 316 | 136 | 245 | 065 | 105 | 285 | 265 | 085 |

***Laser and Laser Radial70° Trapezoid Course Lengths to Marks and Course Lengths – Equal beats, Reaches (1-2 and 3-5) two thirds of beat length***

Start 0.05 nt mi downwind of 4S/4P(4)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **4 - 1 & 1 - 4** | **4 - 2 & 2 - 4** | **1 - 2 & 2 - 1** | **4 - 5** | **5 - F** |  | **I1** |
| **2 - 3 & 3 - 2** | **4 - 3 & 3 - 4** | **5 – 4** | **F - 5** |  | **O1** |
| **0.20** | 0.20 | 0.13 | 0.10 | 0.10 |  | 1.22 |
| **0.25** | 0.25 | 0.17 | 0.11 | 0.10 |  | 1.48 |
| **0.30** | 0.30 | 0.20 | 0.14 | 0.10 |  | 1.75 |
| **0.35** | 0.35 | 0.23 | 0.16 | 0.10 |  | 2.02 |
| **0.40** | 0.40 | 0.27 | 0.18 | 0.10 |  | 2.28 |
| **0.45** | 0.45 | 0.30 | 0.21 | 0.10 |  | 2.55 |
| **0.50** | 0.50 | 0.33 | 0.23 | 0.10 |  | 2.82 |
| **0.55** | 0.55 | 0.37 | 0.25 | 0.10 |  | 3.08 |
| **0.60** | 0.60 | 0.40 | 0.27 | 0.12 |  | 3.37 |
| **0.65** | 0.65 | 0.43 | 0.3 | 0.15 |  | 3.67 |
| **0.70** | 0.70 | 0.47 | 0.32 | 0.17 |  | 3.95 |
| **0.75** | 0.75 | 0.50 | 0.34 | 0.19 |  | 4.24 |
| **0.80** | 0.80 | 0.53 | 0.36 | 0.21 |  | 4.53 |
| **0.85** | 0.85 | 0.57 | 0.39 | 0.24 |  | 4.82 |
| **0.90** | 0.89 | 0.60 | 0.41 | 0.26 |  | 5.11 |
| **0.95** | 0.94 | 0.63 | 0.43 | 0.28 |  | 5.4 |
| **1.00** | 0.99 | 0.67 | 0.46 | 0.31 |  | 5.69 |
| **1.10** | 1.09 | 0.73 | 0.5 | 0.35 |  | 6.27 |
| **1.20** | 1.19 | 0.80 | 0.55 | 0.4 |  | 6.85 |
| **1.30** | 1.29 | 0.87 | 0.59 | 0.44 |  | 7.42 |
| **1.40** | 1.39 | 0.93 | 0.64 | 0.49 |  | 8.01 |
| **1.50** | 1.49 | 1.00 | 0.68 | 0.53 |  | 8.58 |
| **1.60** | 1.59 | 1.07 | 0.73 | 0.58 |  | 9.16 |
| **1.70** | 1.69 | 1.13 | 0.78 | 0.63 |  | 9.75 |
| **1.80** | 1.79 | 1.20 | 0.82 | 0.67 |  | 10.32 |
| **1.90** | 1.89 | 1.27 | 0.87 | 0.72 |  | 10.9 |
| **2.00** | 1.99 | 1.33 | 0.91 | 0.76 |  | 11.48 |

**I1** Start – 1 – 4S/4P – 1 – 2 – 3S/3P – 5 – Finish

**O1** Start – 1 – 2 – 3S/3P – 2 – 3S/3P – 5 – Finish

**3S**

**1**

**4S**

**2**

**3P**

Reference Point for Laying the course

70°

Wind

Start

**4P**

Finish

39°

110°

**5**

Windward-leeward courses with 80° offset mark 1A

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Axis** |  | | | | |  | **Course Axis** |  | | | | |
| **4 – 1A** | **1A - 4** | **1 - 1A** | **1A - 1** | **Signal** | **Pin -** |  | **4 – 1A** | **1A - 4** | **1 - 1A** | **1A - 1** | **Signal** | **Pin -** |
|  |  |  |  | **- Pin** | **Signal** |  |  |  |  |  | **- Pin** | **Signal** |
| **000** | 180 | 280 | 100 | 270 | 090 |  | **180** | 000 | 100 | 280 | 090 | 270 |
| **005** | 185 | 285 | 105 | 275 | 095 |  | **185** | 005 | 105 | 285 | 095 | 275 |
| **010** | 190 | 290 | 110 | 280 | 100 |  | **190** | 010 | 110 | 290 | 100 | 280 |
| **015** | 195 | 295 | 115 | 285 | 105 |  | **195** | 015 | 115 | 295 | 105 | 285 |
| **020** | 200 | 300 | 120 | 290 | 110 |  | **200** | 020 | 120 | 300 | 110 | 290 |
| **025** | 205 | 305 | 125 | 295 | 115 |  | **205** | 025 | 125 | 305 | 115 | 295 |
| **030** | 210 | 310 | 130 | 300 | 120 |  | **210** | 030 | 130 | 310 | 120 | 300 |
| **035** | 215 | 315 | 135 | 305 | 125 |  | **215** | 035 | 135 | 315 | 125 | 305 |
| **040** | 220 | 320 | 140 | 310 | 130 |  | **220** | 040 | 140 | 320 | 130 | 310 |
| **045** | 225 | 325 | 145 | 315 | 135 |  | **225** | 045 | 145 | 325 | 135 | 315 |
| **050** | 230 | 330 | 150 | 320 | 140 |  | **230** | 050 | 150 | 330 | 140 | 320 |
| **055** | 235 | 335 | 155 | 325 | 145 |  | **235** | 055 | 155 | 335 | 145 | 325 |
| **060** | 240 | 340 | 160 | 330 | 150 |  | **240** | 060 | 160 | 340 | 150 | 330 |
| **065** | 245 | 345 | 165 | 335 | 155 |  | **245** | 065 | 165 | 345 | 155 | 335 |
| **070** | 250 | 350 | 170 | 340 | 160 |  | **250** | 070 | 170 | 350 | 160 | 340 |
| **075** | 255 | 355 | 175 | 345 | 165 |  | **255** | 075 | 175 | 355 | 165 | 345 |
| **080** | 260 | 000 | 180 | 350 | 170 |  | **260** | 080 | 180 | 000 | 170 | 350 |
| **085** | 265 | 005 | 185 | 355 | 175 |  | **265** | 085 | 185 | 005 | 175 | 355 |
| **090** | 270 | 010 | 190 | 000 | 180 |  | **270** | 090 | 190 | 010 | 180 | 000 |
| **095** | 275 | 015 | 195 | 005 | 185 |  | **275** | 095 | 195 | 015 | 185 | 005 |
| **100** | 280 | 020 | 200 | 010 | 190 |  | **280** | 100 | 200 | 020 | 190 | 010 |
| **105** | 285 | 025 | 205 | 015 | 195 |  | **285** | 105 | 205 | 025 | 195 | 015 |
| **110** | 290 | 030 | 210 | 020 | 200 |  | **290** | 110 | 210 | 030 | 200 | 020 |
| **115** | 295 | 035 | 215 | 025 | 205 |  | **295** | 115 | 215 | 035 | 205 | 025 |
| **120** | 300 | 040 | 220 | 030 | 210 |  | **300** | 120 | 220 | 040 | 210 | 030 |
| **125** | 305 | 045 | 225 | 035 | 215 |  | **305** | 125 | 225 | 045 | 215 | 035 |
| **130** | 310 | 050 | 230 | 040 | 220 |  | **310** | 130 | 230 | 050 | 220 | 040 |
| **135** | 315 | 055 | 235 | 045 | 225 |  | **315** | 135 | 235 | 055 | 225 | 045 |
| **140** | 320 | 060 | 240 | 050 | 230 |  | **320** | 140 | 240 | 060 | 230 | 050 |
| **145** | 325 | 065 | 245 | 055 | 235 |  | **325** | 145 | 245 | 065 | 235 | 055 |
| **150** | 330 | 070 | 250 | 060 | 240 |  | **330** | 150 | 250 | 070 | 240 | 060 |
| **155** | 335 | 075 | 255 | 065 | 245 |  | **335** | 155 | 255 | 075 | 245 | 065 |
| **160** | 340 | 080 | 260 | 070 | 250 |  | **340** | 160 | 260 | 080 | 250 | 070 |
| **165** | 345 | 085 | 265 | 075 | 255 |  | **345** | 165 | 265 | 085 | 255 | 075 |
| **170** | 350 | 090 | 270 | 080 | 260 |  | **350** | 170 | 270 | 090 | 260 | 080 |
| **175** | 355 | 095 | 275 | 085 | 265 |  | **355** | 175 | 275 | 095 | 265 | 085 |

Windward-leeward courses with 80° offset mark 1A

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Leg lengths** | |  | **Course Distances** | | | |
| **4 - 1** | **1 - 1A** |  | **W1** | **W2** | **W3** | **W4** |
| **1 - 4** | **1A - 1** |  |
| **0.50** | **0.02** |  | 1.12 | 2.14 | 3.16 | 4.18 |
| **0.60** | **0.02** |  | 1.32 | 2.54 | 3.76 | 4.98 |
| **0.70** | **0.02** |  | 1.52 | 2.94 | 4.36 | 5.78 |
| **0.80** | **0.02** |  | 1.72 | 3.34 | 4.96 | 6.58 |
| **0.90** | **0.02** |  | 1.92 | 3.74 | 5.56 | 7.38 |
| **1.00** | **0.02** |  | 2.12 | 4.14 | 6.16 | 8.18 |
| **1.10** | **0.02** |  | 2.32 | 4.54 | 6.76 | 8.98 |
| **1.20** | **0.02** |  | 2.52 | 4.94 | 7.36 | 9.78 |
| **1.30** | **0.02** |  | 2.72 | 5.34 | 7.96 | 10.58 |
| **1.40** | **0.02** |  | 2.92 | 5.74 | 8.56 | 11.38 |
| **1.50** | **0.02** |  | 3.12 | 6.14 | 9.16 | 12.18 |
| **1.60** | **0.02** |  | 3.32 | 6.54 | 9.76 | 12.98 |
| **1.70** | **0.02** |  | 3.52 | 6.94 | 10.36 | 13.78 |
| **1.80** | **0.02** |  | 3.72 | 7.34 | 10.96 | 14.58 |
| **1.90** | **0.02** |  | 3.92 | 7.74 | 11.56 | 15.38 |
| **2.00** | **0.02** |  | 4.12 | 8.14 | 12.16 | 16.18 |
| **2.10** | **0.02** |  | 4.32 | 8.54 | 12.76 | 16.98 |
| **2.20** | **0.02** |  | 4.52 | 8.94 | 13.36 | 17.78 |
| **2.30** | **0.02** |  | 4.72 | 9.34 | 13.96 | 18.58 |
| **2.40** | **0.02** |  | 4.92 | 9.74 | 14.56 | 19.38 |
| **2.50** | **0.02** |  | 5.12 | 10.14 | 15.16 | 20.18 |
| **2.60** | **0.02** |  | 5.32 | 10.54 | 15.76 | 20.98 |
| **2.70** | **0.02** |  | 5.52 | 10.94 | 16.36 | 21.78 |
| **2.80** | **0.02** |  | 5.72 | 11.34 | 16.96 | 22.58 |
| **2.90** | **0.02** |  | 5.92 | 11.74 | 17.56 | 23.38 |
| **3.00** | **0.02** |  | 6.12 | 12.14 | 18.16 | 24.18 |

**W1** Start – 1 – Finish

**W2** Start – 1 – 4S/4P – 1 – Finish

**W3** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – Finish

**W4** Start – 1 – 4S/4P – 1 – 4S/4P – 1 – 4S/4P – 1 – Finish

**1**

**4S**

**1A**

Reference Point for Laying the course

80°

Wind

Start

**4P**

0.02 nt mi

(40 m)

**Average VMG Centreboard Classes (see also pages 93 – 95)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wind speed (Knots) | 3-7 | 5-10 | 7-13 | 10-15 | 13-18 | 15-20 | 18-23 | 20-25 |
| Optimist |  |  |  |  |  |  |  |  |
| P Class |  | 2.4 | 2.7 | 2.6 |  |  |  |  |
| Starling | 3.3 | 3.5 | 3.7 | 3.9 | 4.1 | 4.0 |  |  |
| Splash |  |  |  |  |  |  |  |  |
| Laser Radial |  | 4.4 |  | 4.8 |  | 5.3 | 5.0 |  |
| Europe | 3.0 | 3.5 | 4.0 | 4.1 | 4.6 | 5.0 | 5.3 |  |
| Laser |  | 5.0 | 5.0 | 5.0 |  | 5.4 |  |  |
| Finn | 3.3 | 3.8 | 4.1 | 4.8 | 5.5 | 6.0 | 6.5 | 6.4 |
| Laser II |  | 5.4 |  | 5.8 |  |  |  |  |
| 420 |  |  |  | 4.7 | 5.1 | 6.2 | 6.6 |  |
| 470 | 3.1 | 4.0 | 5.0 | 5.5 | 6.0 | 6.0 |  |  |
| 49er |  |  |  |  |  |  |  |  |
| Mistral | 5.5 | 6.0 | 7.0 |  |  | 8.1 | 9.3 | 12.0 |
| Tornado | 4.1 | 5.1 | 6.0 | 6.8 | 7.3 | 7.8 |  |  |
| Etchell |  |  |  |  | 5.7 | 5.8 | 6 | 6.2 |
| RS:X Men | 3.8 | 4.5 | 5 |  | 9 | 9.8 | 10.5 | 11.5 |
| RS:X Women | 3.3 | 3.6 | 4 |  | 7 | 7.8 | 8.9 | 9.5 |

The speeds (in knots) given above are based on an average speed made good around a typical triangular or trapezoidal course for the leading boat.

Distance (nautical miles) = Speed (knots) × Time (hours)

The speeds given above are a guide only. Thought needs to be given to sea conditions and the experience of the competitors when determining the length of the course.

The table below is useful, particularly in the protest room, to help determine how far boats have travelled

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Speed in Knots and metres per second | | | | | | | | | | | | |
| Knots | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| m/s | 0.5 | 1.0 | 1.5 | 2.1 | 2.6 | 3.1 | 3.6 | 4.1 | 4.6 | 5.1 | 5.7 | 6.2 |