

## POINTWORK.

A point is nearly always defined by the angle of the Frog, and these are normally referred to as; 1 in 4, 1 in 7 etc. This angle is measured at the apex of the frog, tangentially to the curve.

**TABLE 1**

Frog Angle	Radial Angle	Cotangent	Sine	Inversed Sine
1 in 3	18d - 28m	3.000	0.3162	0.05130
1 in 3.25	17d - 6m	3.250	0.2940	0.04420
1 in 3.5	15d - 56m	3.502	0.2740	0.03842
1 in 3.75	14d - 56m	3.749	0.2577	0.03377
1 in 4	14d - 3m	3.996	0.2428	0.02984
1 in 4.25	13d - 14m	4.253	0.2290	0.02266
1 in 4.5	12d - 32m	4.499	0.2170	0.02383
1 in 4.75	11d - 53m	4.752	0.2060	0.02143
1 in 5	11d - 18m	5.005	0.1960	0.01938
1 in 5.5	10d - 18m	5.503	0.1790	0.01611
1 in 6	9d - 27m	6.008	0.1642	0.01357
1 in 6.5	8d - 45m	6.497	0.1521	0.01164
1 in 7	8d - 8m	6.998	0.1415	0.01006
1 in 8	7d - 7m	8.010	0.1239	0.00770

You will note from the table above that the Cotangent of the Angle 'A' of the frog is **very nearly** the ratio of the Frog proportions...

The Frog Angle required may be found from the following table of curve radii.

**TABLE 2**

Radius Metres	Inversed Sine	Frog Angle	Radius Feet	Inversed Sine	Frog Angle
2	0.0317	3.75	6	0.0347	3.75
2.25	0.0282	4	7	0.0297	4
2.5	0.0254	4.25	8	0.0260	4.25
2.75	0.0230	4.5	9	0.0231	4.5
3	0.0211	4.75	10	0.0208	4.75
3.25	0.0195	5	11	0.0189	5
3.5	0.0181	5	12	0.0173	5
3.75	0.0169	5.5	13	0.0160	5.5
4	0.0158	5.5	14	0.0148	5.5
4.25	0.0149	6	15	0.0138	6
4.5	0.0141	6	16	0.0130	6
4.75	0.0133	6	17	0.0122	6.5
5	0.0127	6.5	18	0.0115	6.5

For example a Radius of 3.25 metres would require a Frog of **1 in 5**, while a Radius of 13 feet would require a Frog of **1 in 5.5**

The dimensions of a set of points may be found by using the formulae below:

$LTF = \text{Radius of Curve} \times \text{Sine of Frog Angle}$

$LCO = (2 \times \text{Sine of Frog Angle} \times \text{Radius of curve}) + (0.5 \text{ SX} \times \text{Cotangent of Frog Angle})$

