The degree of curvature of a curve, as used in this book, is the central angle of the curve that is subtended by an arc of 100 ft.
The relation between the degree of curvature *D* and the radius *R* can be derived as follows:
See Figure. By definition, whatever the sharpness of the curve, the angle *D* is subtended by and arc of 100 ft. Therefore D^o is to 360^o as 100 ft is to the circumference of a circle of the same radius.

Hence: $\frac{D}{360} = \frac{100}{(2\pi R)}$ $\quad D \cdot R = \frac{(100 \cdot 360)}{(2\pi)} = 5729.578$

Example: Given $D = 5^o$, find *R*

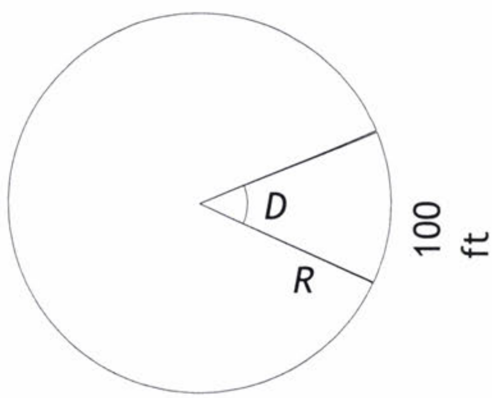
$$R = \frac{5729.578}{5} = 1145.92$$

Given *R* = 900 ft, find *D*

$$D = \frac{5729.578}{900} \qquad D = 6.3662^o = 6^o 21' 58''$$

minutes $0.3662 \times 60 = 21.972$ seconds $0.972 \times 60 = 58.32$

With few exceptions, every curve used in highway practice is chosen so that either its radius or its degree of curvature is expressed in round numbers. In this book these two types are called even radius curves and even degree curves, respectively. Even radius curves simplify the computation of complex alignment arrangements like interchange designs. Even degree curves are more easily staked out.



CHAPTER 4

SIMPLE CURVES

38. A simple curve is a circular arc joining two tangents. See Fig. 11.

The **forward direction** of a location survey is the direction of increasing station numbers. The tangent previous to the curve is called the **back tangent**, the tangent following the curve is called the **forward tangent**. The beginning of the curve at the tangent point is called the **point of curve** or **P.C.**, the tangent

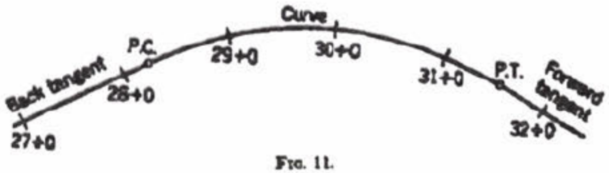


Fig. 11.

point at the end of the curve is called **point of tangency** or **P.T.** Sometimes the P.C. is called the T.C. (tangent to curve) and the P.T. is called the C.T. (curve to tangent).

The sharpness of the curve is designated either by its **radius** or its **degree of curvature**. The degree of curvature has several slightly different definitions. In highway practice one definition is coming more and more into use. It is that usually known as the arc definition and it is *the only definition used in this book*. For other definitions and tables for them, the reader is referred to *Field Engineering* by Searles, Ives, and Kissam, John Wiley and Sons, Inc.

39. The degree of curvature of a curve, as used in this book, is the central angle of the curve that is subtended by an arc of 100 ft.

The relation between the degree of curvature D and the radius R can be derived as follows:

See Fig. 12. By definition, whatever the sharpness of the curve, the angle D is subtended by an arc of 100 ft. Therefore $D°$ is to

360° as 100 ft is to the circumference of a circle of the same radius. Hence:

$$D/360 = 100/2\pi R$$

$$D \cdot R = 5729.578 \qquad (2)$$

Examples. Given $D = 5°$, to find R.

$$R = 5729.578/5$$

$$R = 1145.92$$

Given $R = 900$ ft, to find D.

$$D = 5729.578/900$$

$$D = 6.3662° = 6° 21' 58''$$

With few exceptions, every curve used in highway practice is chosen so that either its radius or its degree of curvature is ex-

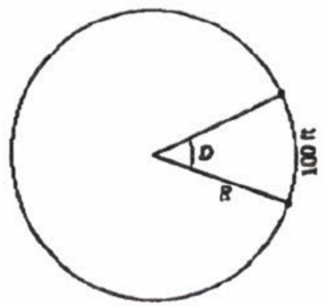


Fig. 12.

pressed in round numbers. In this book these two types are called **even radius curves** and **even degree curves**, respectively. Even radius curves simplify the computation of complex alignment arrangements like interchange designs. Even degree curves are more easily staked out.

40. Stationing on curves. As stated previously, measurement and stationing are carried without interruption along the tangents and around the arcs of the curves. The 100 ft that separates adjacent stations may lie partly on a tangent and partly on the curve as shown in Fig. 11 (Stations 28–29 and Stations 31–32). Since the length of arc between stations is 100 ft, the central angle subtended between adjacent stations that are