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Dprtmt f Mthmtcs, VT hpl Uvrsty

ppld Nmrcl Mthds (MT23)

**Prblm St-3**

**Itrplt**

**---------------------------------------------------------------------------------**

1. Prove the following relations:

(a) .

(b) .

(c) .

(d) .

(e) .

(f) .

1. If , show that .
2. The following table gives the distance in nautical miles of the visible horizon for the given heights in feet above the earth’s surface.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

Find when feet.

1. Find the number of students from the following data who secured not more than 45.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Marks range |  |  |  |  |  |
| No. of students |  |  |  |  |  |

1. Find a polynomial of lowest possible degree such that for
2. Find the value of from the given table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |

1. If be the successive entries corresponding to equidistant arguments in a table. Show that when third differences are taken into account, the entry corresponding to the argument half way between the arguments at and is , where is the arithmetic mean of and and is the arithmetic mean of and
2. The area of a circle of diameter is given for the following values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Find for

1. The population of a town is as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year |  |  |  |  |  |  |
| Population (in lakhs) |  |  |  |  |  |  |

Estimate the increase in population during the period to

1. Determine the percentage number of criminal under 35 years:

|  |  |
| --- | --- |
| Age | % no. of criminals |
| Under 25 years | 52 |
| Under 30 years | 67.3 |
| Under 40 years | 84.1 |
| Under 50 years | 94.4 |

1. The following table gives the normal weights of babies during the first 12 months of life:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Age in months |  |  |  |  |  |  |
| Weight in lbs |  |  |  |  |  |  |

Find the weight of babies during to months in life.

1. Estimate the production of wool in the year 1935 from the given data:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Year |  |  |  |  |  |  |  |
| Production |  |  |  |  |  |  |  |

1. Let be the interpolating polynomial far the data Find if the coefficient of in is
2. Using cubic spline interpolation, find the value of at , for the following data:

(0, 1), (1, 2), (2, 9) and (3, 28).

1. Fit the following four points by thecubic splines:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 |
|  | 1 | 5 | 11 | 8 |

Use the end conditions . Hence compute (i) and (ii) .

1. Given the points, and satisfying the function , , determine the value of using the cubic spline approximation.