```
            return Double.NaN;
        } else {
            return arcsin.evaluate(x);
        }
    }

    static { // creates the static function arcsin when class is loaded
        int n = 10;
        double[] xValues = new double[n];
        double[] yValues = new double[n];
        double x = -Math.PI/2, dx = Math.PI/(n-1);
        for(int i = 0;i<n;i++) {
            xValues[i] = x;
            yValues[i] = Math.sin(x);
            x += dx;
        }
        arcsin = new CubicSpline(yValues, xValues);
    }
}
```

Problem 11.29 Inverse functions

(a) How accurate is the arcsin x function shown in Listing 11.7 in the interval $|x| < 0.5$?

(b) Compare the number of tabulated points needed to produce relative accuracies of $1:10^2$, $1:10^3$, and $1:10^4$ in the interval $-0.5 < x < 0.5$.

(c) Is polynomial interpolation more or less efficient than spline interpolation for evaluating inverse functions?

(d) Discuss the accuracy of the inverse interpolation of $\sin x$ if the interval is extended to $|x| \leq 1$. ■

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