

To add the rejection regions to the plot based on the data from `data.txt`, we need to define the rejection regions (left and right tails) and shade them accordingly. Since the data in `data.txt` is discrete, we can use the `filledcurves` feature to shade the areas outside a given threshold (e.g.,  $x < -1.5$  and  $x > 1.5$ ).

Here's the modified `my.gnu` script with the rejection regions added:

```
reset
set terminal pngcairo enhanced
set output 'out1.png'

# Set labels
set xlabel "x"
set ylabel "Probability Density"
set key top left

# Define the threshold for rejection regions
threshold = 1.5

# Plot data from data.txt
plot 'data.txt' using 1:2 title "Data" with lines linewidth 2 lc rgb "purple", \
      'data.txt' using 1:($1 < -threshold ? $2 : 1/0) title \
      "Left Rejection Area" with filledcurves y1=0 lc rgb "gray", \
      'data.txt' using 1:($1 > threshold ? $2 : 1/0) title \
      "Right Rejection Area" with filledcurves y1=0 lc rgb "gray"
### Explanation of Changes:
```

#### 1. Threshold Definition:

- We define `threshold = 1.5` to specify the cutoff for the rejection regions.

#### 2. Rejection Regions:

- For the **left rejection region** ( $x < -\text{threshold}$ ), we use:

```
'data.txt' using 1:($1 < -threshold ? $2 : 1/0)
```

This selects points where  $x < -1.5$  and plots their corresponding  $y$  values. If the condition is not met, `1/0` (which is invalid) is used to skip the point.

- For the **right rejection region** ( $x > \text{threshold}$ ), we use:

```
'data.txt' using 1:($1 > threshold ? $2 : 1/0)
```

This selects points where  $x > 1.5$  and plots their corresponding  $y$  values.

#### 3. Shading with `filledcurves`:

- The `filledcurves y1=0` option fills the area between the curve and the  $y=0$  line, creating the shaded rejection regions.
- The `lc rgb "gray"` sets the fill color to gray.

#### 4. Titles:

- The `title "Left Rejection Area"` and `title "Right Rejection Area"` provide labels for the shaded regions in the legend.

### Output:

This script will generate a plot where:

- The data from `data.txt` is plotted as a purple line.
- The left and right rejection regions (outside  $x = -1.5$  and  $x = 1.5$ ) are shaded in gray.

Let me know if you need further adjustments! ■