Jones(Tre) – Tabachka

1305

Minor gridlines on log scaled axes is needed. You are using major gridlines.

1311

The model will work for 25-100 m, 125 and 150 m are outside the range of the model.

0-2decimals would be good. But you used more than 2 decimals.

You should include “meter” as the unit.

1000

You have to use histogramRight command to get the bin frequencies.

You plot should have both markers and line style formatting.

13.05 Create plots with linear and/or log axis scales (Excel)

PS07\_earthquakes\_login.xlsx > Earthquakes Sheet

ou will check items 1-4 to see that all four plot types are present.

- Grade items 5 – 9 ONLY on the LOG Scale X, LINEAR Scale Y

Evidence items for proficiency:

1. Plot data on linear scale: linear scale on x-axis, linear scale on y-axis
2. Plot data on log-linear scale: log scale on x-axis, linear scale on y-axis
3. Plot data on linear-log scale: linear scale on x-axis, log scale on y-axis
4. Plot data on log-log scale: log scale on x-axis, log scale on y-axis
5. Function discovery plots display original independent and dependent data (i.e., non-linearized data) whose relationship is being examined
6. Each plot has x- and y-axis labels that reference the data in the plot and do not reference the type of scale used

Minor gridlines on log scaled axes is needed. You are using major gridlines.

1. Manage the horizontal axis crosses option so that the x-axis tick labels are at the bottom of the plot

Manage the decimal places shown on the x and y axis tick marks

13.06 Create plots with linear and/or log axis scales (MATLAB)

PS07\_earthquakes\_login.xlsx > Earthquakes Sheet

Grade the function discovery 2x2 subplot figure window.

1. Plot data on linear scale: use plot command for linear scale on x-axis, linear scale on y-axis
2. Plot data on log-linear scale: use semilogx command for log scale on x-axis, linear scale on y-axis
3. Plot data on linear-log scale: use semilogy command for linear scale on x-axis, log scale on y-axis
4. Plot data on log-log scale: use loglog command for log scale on x-axis, log scale on y-axis
5. Function discovery plots display original independent and dependent data (i.e., non-linearized data) whose relationship is being examined

Each plot has x- and y-axis labels that reference the data in the plot and do not reference the type of scale used

07.05 Format plots for technical presentation

PS07\_beach\_logins.pdf > FUNCTION DISCOVERY SUBPLOTS

Grade all of the function discovery 2x2 subplots for the evidence items below.

Evidence items for proficiency:

1. Correct syntax for title
2. Correct syntax for xlabel
3. Correct syntax for ylabel
4. A descriptive title that references the problem context, the independent (x) variable, and the dependent (y) variable

If suptitle is used, each subplot still needs a short title

Gridlines is not on.

13.03 Confirm function identification using a combination of linear and log axis scales

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| --- | --- |
| PS07\_earthquakes\_login.xlsx > Question Sheet > Q1  AND  PS07\_beach\_profile.pdf > ANALYSIS > Q1 | *Prob 1, Step 4*  *AND*  *Prob 2, Step 4:* |
| Grade the answer to Problem 1, Q1:  The function type is a logarithmic function because the data appear linear when plotted on a log-x, linear-y scale  Also grade the answer to Problem 2, Q1:  The relationship is represented by a power function. To identify that, look at the four subplots. The log-log plot is the most linear. Power functions are linear when plotted on log scales. | |

Evidence items for proficiency:

1. Identify the independent and dependent data variables that need transformation (or log scaling) to linearize the data

Problem 1: Log scale on x-axis, linear scale on y-axis

1. Identify the function type that corresponds to the transformations (or log scaling) needed to linearize the data

Problem 1: Logarithmic

1. Correctly explain process for determining the function type from the scaled plots

Problem 1: justify their choice based on their plots

1. Identify the independent and dependent data variables that need transformation (or log scaling) to linearize the data

Problem 2: Log scale on x-axis, log scale on y-axis (loglog)

1. Identify the function type that corresponds to the transformations (or log scaling) needed to linearize the data

Problem 2: Power

1. Correctly explain process for determining the function type from the scaled plots

Problem 2: justify their choice based on their plots

13.07 Linearize and plot data appropriately

|  |  |
| --- | --- |
| PS07\_beach\_logins.pdf > LINEARIZED DATA | *Prob 2, Step 5:* |
| Grade the linearized data on the linearized data plot.  NOTE: do not grade the regression line or any formatting other than what is below.  % linearize the data for use in power function  log\_offshore = log10(offshore); % log of offshore distance  log\_depth = log10(depth); % log of water depth  % Plot linearized data  figure(2)  plot(log\_offshore,log\_depth,'g\*')  xlabel('Log (Offshore Distance in Meters)')  ylabel('Log (Depth in Meters)') | |

Evidence items for proficiency:

1. Linearize the independent variable data correctly based on the diagnosed function type
   * Power: log of independent data
2. Linearize the dependent variable data correctly based on the diagnosed function type
   * Power: log of dependent data
3. Axes labels (description and units) are correct based on the plotted data

You will need to see what they plotted to see if their units match what’s in their plot command. You’ll grade whether or not they plotted the correct information in the next LO

07.01 Create an x-y plot from a single data set

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| --- | --- |
| PS07\_beach\_logins.pdf > LINEARIZED DATA | *Prob 2, Step 5:* |
| Grade that the linearized data is plotted on linear scales using the plot command  NOTE: do not grade the regression line or any formatting other than what is below.  % linearize the data for use in power function  log\_offshore = log10(offshore); % log of offshore distance  log\_depth = log10(depth); % log of water depth  % Plot linearized data  figure(2)  plot(log\_offshore,log\_depth,'g\*')  xlabel('Log (Offshore Distance in Meters)')  ylabel('Log (Depth in Meters)') | |

Evidence items for proficiency:

1. Correct syntax for the plot command: plot(x, y, ‘line/marker formatting’)
2. Correct identification of the independent (x) and dependent (y) variables

The student must plot the linearized offshore distance as X and linearized depth as Y

1. Correct use of data markers and lines: data markers with no line (for raw data)

You will need to see what they plotted to see if their units match what’s in their plot command. You’ll grade whether or not they plotted the correct information in the next LO

13.09 Determine the linear and general forms of the equations for linear, power, exponential, and logarithmic functions

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| --- | --- |
| PS07\_beach\_logins.pdf > BEACH PROFILE MODEL | *Prob 2, Step 6:* |
| Grade the code to see if the coefficients for the general form of the model were found correctly and were used to determine the model correctly.  May need to look in both the LINEARIZED DATA section and the BEACH MODEL section to get all pertinent information  coeffs = polyfit(log\_offshore,log\_depth,1);  % general form of power function: y = b\*x^m  M = coeffs(1); % slope of linearized data  B = coeffs(2); % intercept of linearized data  b = 10^(B); % convert linearized B to power function b  m = M; % linearized M equals power function m  fprintf('water depth = %1.3f\*(offshore distance)^%1.3f\n',b,m)  NOTE: don’t grade the correctness of the fprintf syntax. Only use to determine if the coefficients are being used correctly | |

Evidence items for proficiency:

1. Identify slope (M) and intercept (B) coefficients for the best-fit linear model of the linearized data
   * Power: use log(x) and log(y) transformed data
2. Place M and B correctly within the linear form of the equation
3. Correctly determine the general form constant m from the linear form slope M
   * Power: M = m
4. Correctly determine the general form constant b from the linear form intercept B
   * Power: B = log(b)
5. Replace (m) correctly within the general form of the equation
   * Power: y = bxm
6. Replace (b) correctly within the general form of the equation

Power: y = bxm

13.11 Use the function to make predictions only when appropriate

The model will work for 25-100 m, 125 and 150 m are outside the range of the model.

1. Predicted numerical values must be consistent with the equation used to make the prediction

correct model would give these approximate values

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| distance | 25 m | 50 m | 75 m | 100 m | *125 m* | *150 m* |
| depth | 7.7 m | 12.3 m | 16.2m | 19.8m | *23.0m* | *26.1m* |

Units are meters for both the water depth and the offshore distances

0-2 decimal places on water depth is appropriate.

10.00 Create and interpret cumulative distribution plots

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| --- | --- |
| PS04\_deburr\_login\_report.pdf | *Prob 3*: |
| This is a review problem, so the you will grade selected items throughout the code. See the evidence list below | |

Correct syntax for cumsum function

You have to use histogramRight to get the bin frequencies.

You CDP should have both markers and line style formatting.

10.06 Estimate and/or describe the process for determining the characteristics of the underlying data set from the cumulative distribution plot

|  |  |
| --- | --- |
| PS03\_deburr\_login\_report.docx > ANALYSIS > Q1 | *Prob 3, Step 6.Q1:* |
| Grade the **answer** to Q1: For each deburring media type, what is the median time to failure?  % The median time to failure for each media is:  % New Age: 50 hrs  % Triangle: 49 hrs  % Ever Last: 46 or 47 hrs  % The median is found by reading the hours at a cumulative fractional value of 0.5.  If student generated CDP is different but the median matches their CDP, it should be marked correct. A note should be provided to see the solution for the correct CDP | |

Evidence items for proficiency:

1. Estimate the median of the data by reading the CDP at 0.5 cumulative fractional value (within 2% of solution answer)

New Age – Acceptable median is between 49 – 51 hrs (or within 2% of what their CDP shows)

Triangle – Acceptable median is between 48 – 50 hrs (or within 2% of what their CDP shows)

Ever Last – Acceptable median is between 45.5 – 47.5 hrs (or within 2% of what their CDP shows)

1. Clear description of a process for determining the median