a. Scatter plot: non-linear relations between x and y, possible concave shape

Normal QQ plot: non-linear, curve up on both ends, possible violation on normality

Residual plot: not random pattern, possible concave, violation on equal variances

Violations on assumptions, not valid model

b. $\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x = 7.9163 + 1.4396x$

10-month-old, $\hat{y} = 22.3123$, $s = 3.981$, $t_{\alpha/2,\ n-2} = 2.0017$, formula 12E

P.I. = (14.20, 30.42)

c. CI. = (20.81, 23.81) Formula 12 E

P.I. is wider than C.I. but both centered at the $\hat{y} = 22.3123$. Extra variance into P.I.

d. NO!. 3-year-old, i.e. 36-month-old out of range 0-14. Extrapolation

e. Scatter plot: linear trend between x and y

Normal QQ plot: close to linear, no significant violation on normality

Residual plot: random, no significant pattern, no significant violation on equal variances

No significant violations on assumptions, a valid model

f. Relatively simple and interpretable, often validates the assumptions, helps with skewed data

g. Formula 13 E

Ho: There is not a linear trend, i.e.$\beta 1 = 0$

Ha : There is a linear trend, i.e.$\beta 1 \neq 0$

Reject Ho if $p < 0.05$

{RR reject Ho if $|t| \geq t_{(0.025,60-2-1)}$}

p-value = 2.2e−16

Reject Ho, there is a linear trend.