

Part (a): Predicted Values and Residuals

The predicted values and residuals for all 20 observations are provided below, based on the Minitab output:

Table 1: Predicted Values and Residuals for Lease Fee Regression

PROPERTY	LEASEFEE	SIZE	SIZE_SQ	FITS (Predicted \hat{y})	RESI (LEASEFEE - \hat{y})
1	70.7	13.5	182.25	99.990	-29.290
2	52.7	9.6	92.16	60.753	-8.053
3	87.6	17.6	309.76	139.147	-51.547
4	43.2	7.9	62.41	43.043	0.157
5	103.8	11.5	132.25	80.111	23.689
6	45.1	8.2	67.24	46.195	-1.095
7	86.8	15.2	231.04	116.486	-29.686
8	73.3	12.0	144.00	85.129	-11.829
9	144.3	13.8	190.44	102.928	41.372
10	61.3	10.0	100.00	64.867	-3.567
11	148.0	14.5	210.25	109.738	38.262
12	85.0	10.2	104.04	66.916	18.084
13	171.2	18.7	349.69	149.288	21.912
14	97.5	13.2	174.24	97.041	0.459
15	158.1	16.3	265.69	126.964	31.136
16	74.2	12.3	151.29	88.124	-13.924
17	47.0	7.7	59.29	40.935	6.065
18	54.7	9.9	98.01	63.840	-9.140
19	68.0	11.2	125.44	77.085	-9.085
20	75.2	12.4	153.76	89.120	-13.920

Part (b): Residual Plot

The residual vs. fitted plot shows a fan-shaped pattern, indicating heteroscedasticity (variance increases with \hat{y}).

Part (c): Test for Heteroscedasticity

$s_{\text{low}} = 13.6491$, $s_{\text{high}} = 36.1252$.

Ratio: $s_{\text{high}}/s_{\text{low}} = 2.647$, confirming heteroscedasticity.

Part (d): Recommendations

The estate should not use the current model due to heteroscedasticity. Recommended actions:

- Implement WLS to adjust for unequal variances.
- Apply a log transformation to LEASEFEE.

- Explore a piecewise linear model with a knot at $\text{SIZE} = 12$.
- Collect more data and consider additional predictors.

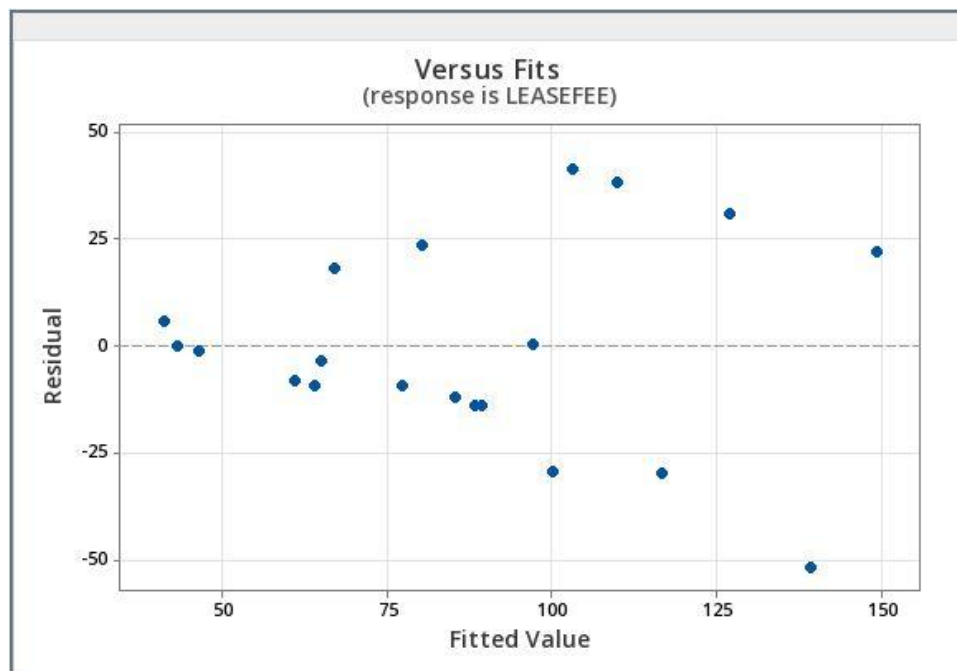


Figure 1: residual vs. fitted