2005Q3

(a) Yes, a linear model is appropriate for modelling these data because there is no pattern in the residuals plot.

(b) The slope of the LSRL is 2.1495 units per mile per car so fuel consumption is predicted to increase by 2,1495 units for each additional railcar. The problem says each fuel unit costs $25, so...

$$(25)(2.1495) = \$53.7375$$

...the change in average cost of fuel per mile is predicted to be $53.74 for each additional railcar added to the train.

(c) $r^2 = 96.7\%$,
About 96.7%, of the variation in fuel consumption per mile is explained by the LSRL model which relates fuel consumption to number of railcars.

(d) No, because the dataset's highest explanatory value is 50 cars. Using the LSRL with $x = 65$ would be extrapolation, which should be avoided.