

XL2B: V0P Excel2013 Model Trendline Multi 1

Model Using Trendline Multiple Models in Excel 2013

by
Milo Schield
Fellow: American Statistical Association
Member: International Statistical Institute
US Rep: International Statistical Literacy Project

Materials at: www.StatLit.org/pdf/Excel2013-Model-Trendline-Multi-Slides.pdf
[Excel/Pulse.xls](http://www.StatLit.org/pdf/Excel2013-Model-Trendline-Multi-Slides.pdf)

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Assignment:

1. Goal: Generate six charts. Use different models of the association between two variables (slides 6-11).
2. Six models: linear with forecast, linear with zero intercept, polynomial, logarithmic, power & exponential.
3. For each chart, show trend-line, regression equation and R^2 . Show title and axis headings for all
4. No description of association (trend) is required. No comparison of fit is required (See slide 12)

Get data at www.StatLit.org/Excel/pulse.xls
To review using Trendline, see www.StatLit.org/pdf/Excel2013-Model-Trendline-Linear-Slides.pdf

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Process Advice

1. Create first XY chart: Weight (Y), Height (X)
2. Format Y axis [Min, Max]: [90, 230]
3. Add axis titles and chart title.
Create trendline, equation and R-squared.
Format as needed. Line can be solid or dashed
4. Copy + paste this graph to create next graph.
5. Delete old trendline; Modify as needed.
Step 4 saves time: skips repeating first 3 steps.

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Algebraic Models

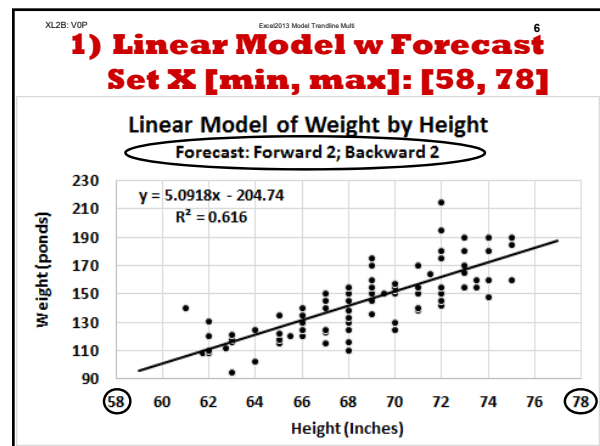
- 1) **Linear:** $Y=a+bx$. Linear with prediction
- 2) **Linear:** $Y = bx$. Linear with zero intercept
- 3) **Polynomial:** $Y= a+bx+cx^2+dx^3$. Multi-curves
- 4) **Logarithmic:** $Y=a*\ln(x) + b$. $100/10 = 10/1$
 $\log_{10}(1) = 0$; $\log_{10}(10) = 1$; $\log_{10}(100) = 2$
 $\log(100)-\log(10)=\log(10)-\log(1)$
- 5) **Power model:** $Y=ax^b$ [Between log & exp.]
- 6) **Exponential:** $Y=ae^{x/b}$. Constant rate of change

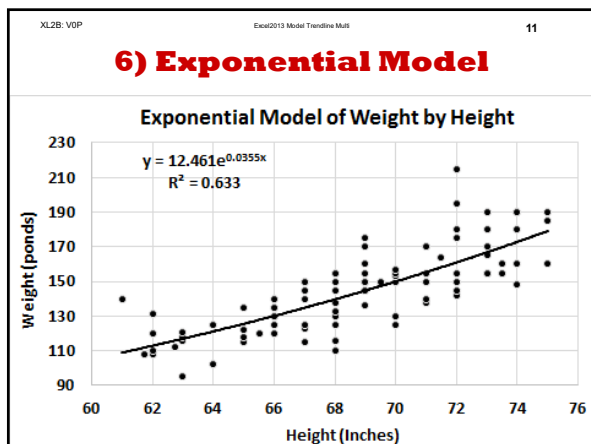
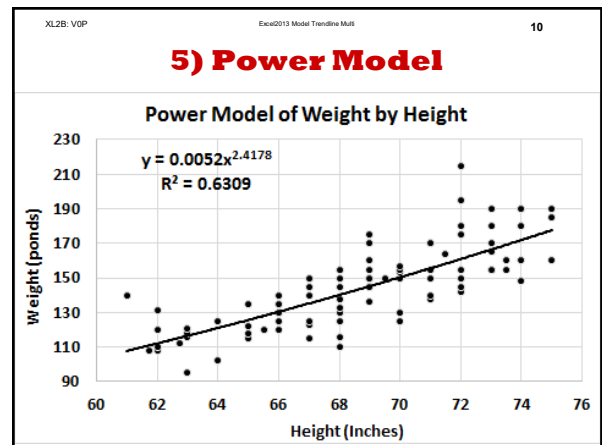
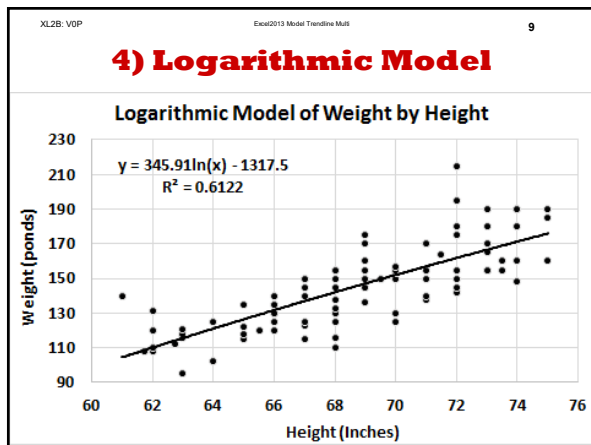
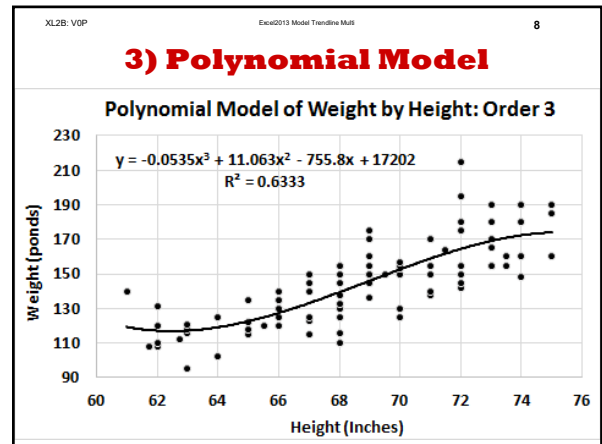
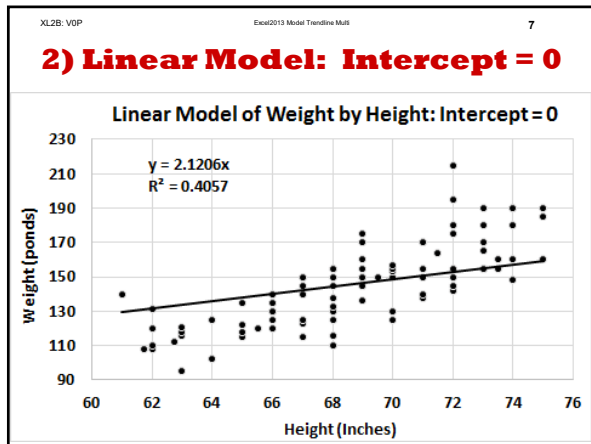
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To create each graph, use Trendline: "More Options"

Select '+': Chart Elements
Do not check Trendline box
At Trendline, press right arrow
Select More Options

Select Algebraic model
Check Equation & R-square
[Check Forecast or Intercept]





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Comparison of Models by Fit [Not Required]

Linear Fit measured by R-sq:
Percentage of Weight “explained by” Height

- 40.6% Linear (intercept=0) Worst fit
- 61.2% Logarithmic model OK fit.
- 61.6% Linear model OK fit. Simplest
- 63.1% Power model Best fit complex
- 63.3% Exponential Best fit complex
- 63.3% Polynomial model (3) Best fit complex

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- 5) **Power model:** $Y=ax^b$ [Between log & exp.]
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To create each graph, use Trendline: "More Options"

The image shows the Excel interface for adding a trendline to a chart. On the left, the 'CHART ELEMENTS' task pane is open, with the 'Trendline' checkbox unchecked. In the center, the 'TRENDLINE OPTIONS' task pane is open, with the 'More Options...' option selected. On the right, the 'TRENDLINE OPTIONS' sub-pane is open, showing the 'Linear' model selected. The 'Forecast' checkbox is checked, and the 'Display Equation on chart' and 'Display R-squared value on chart' checkboxes are also checked. Handwritten numbers 1 through 6 are placed over various options: 1 and 2 over 'Forecast', 3 over 'Set Intercept', 4 over 'Linear', 5 over 'Power', and 6 over 'Exponential'. The word 'All' is written in the bottom right of the sub-pane.

Select '+': *Chart Elements*
 Do not check *Trendline* box
 At Trendline, press right arrow
 Select *More Options*

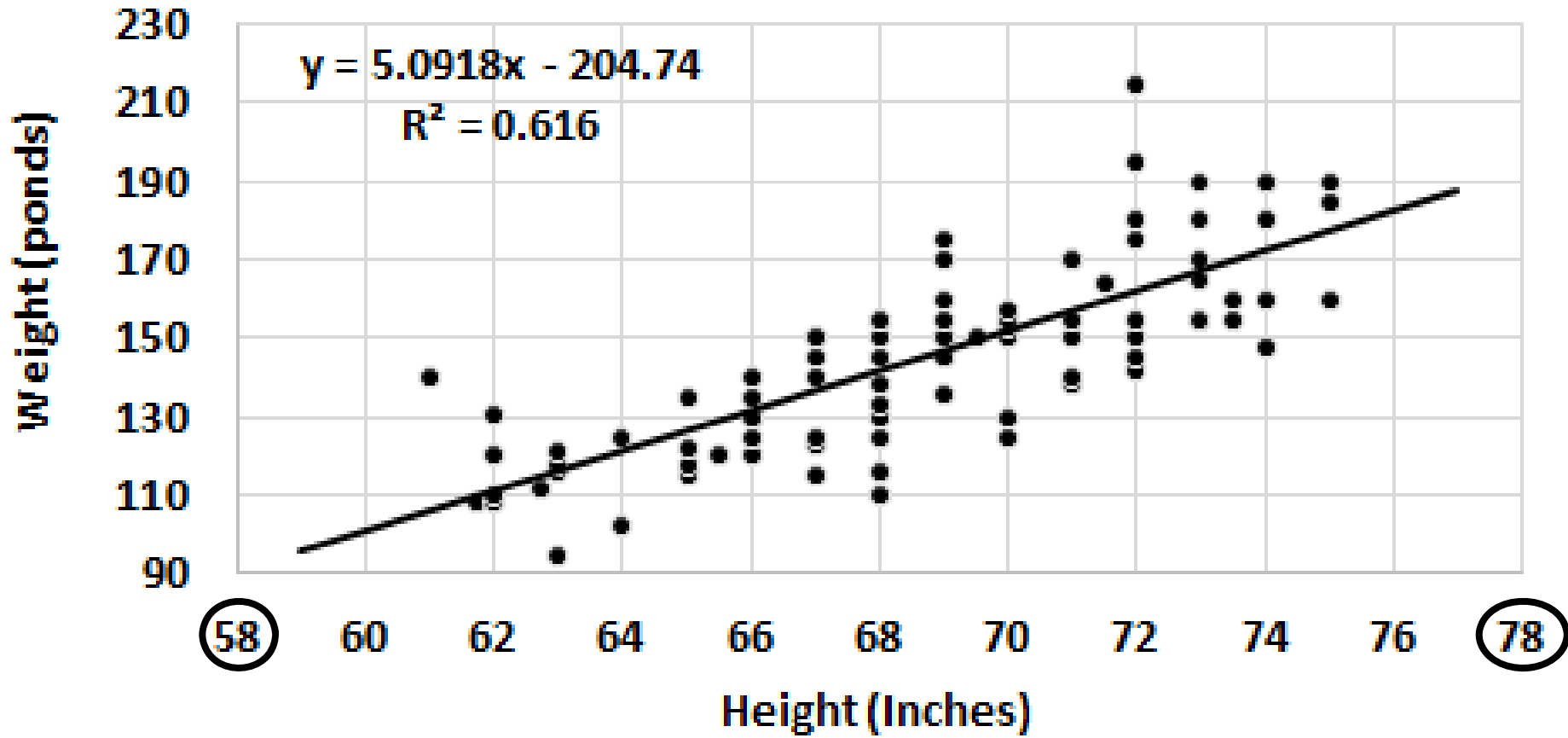
Select *Algebraic model*
 Check *Equation & R-square*
 [Check *Forecast or Intercept*]

1) Linear Model w Forecast

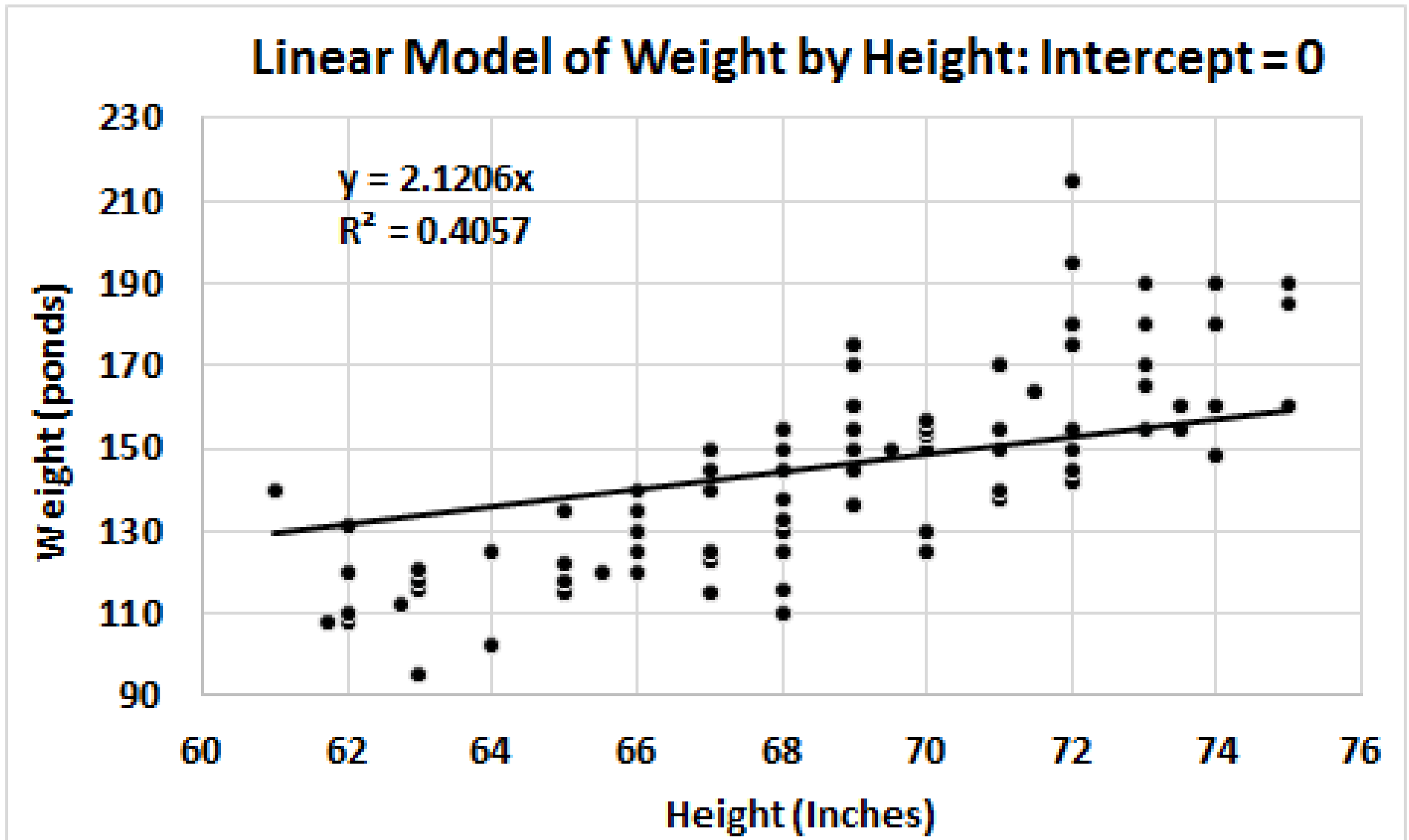
Set X [min, max]: [58, 78]

Linear Model of Weight by Height

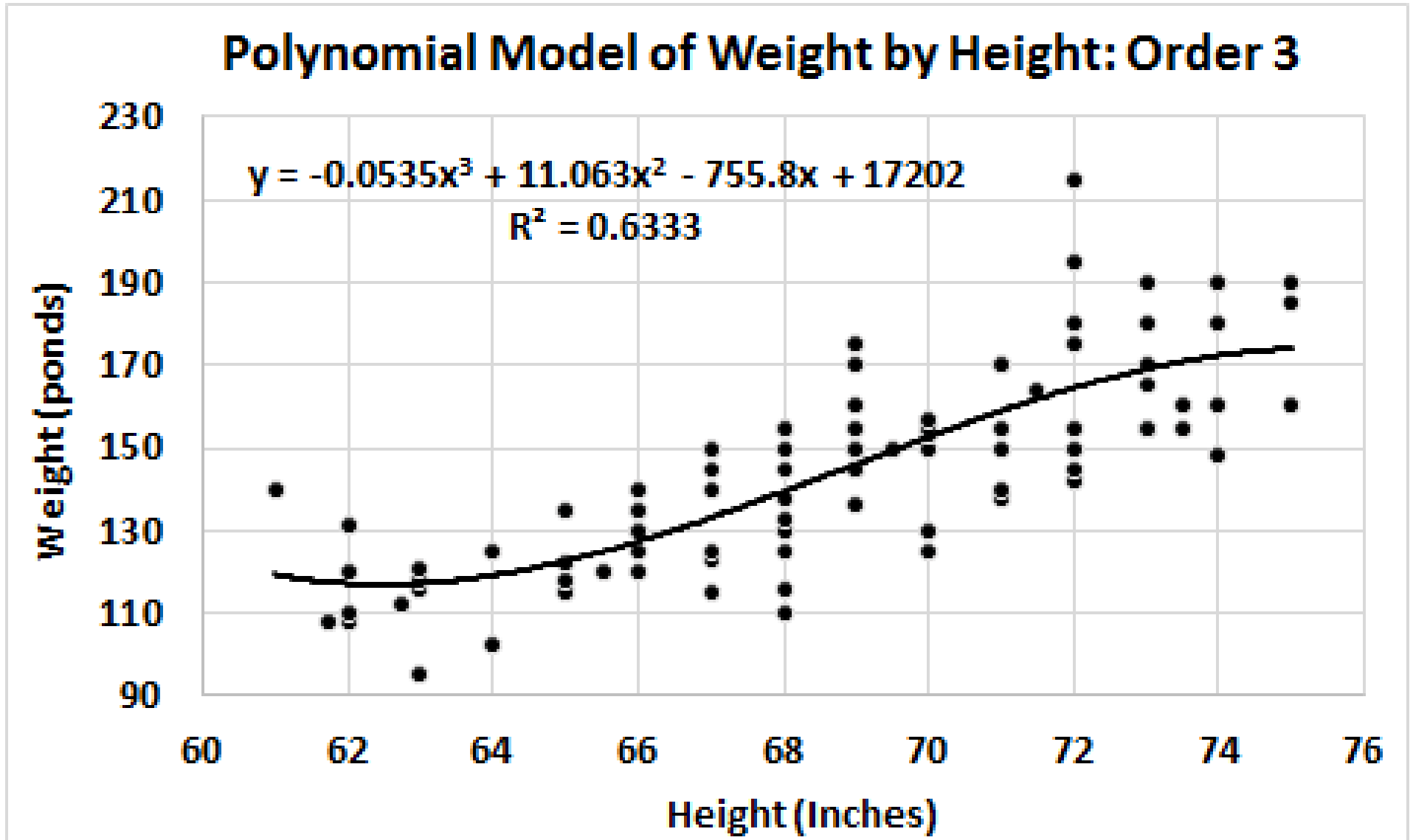
Forecast: Forward 2; Backward 2



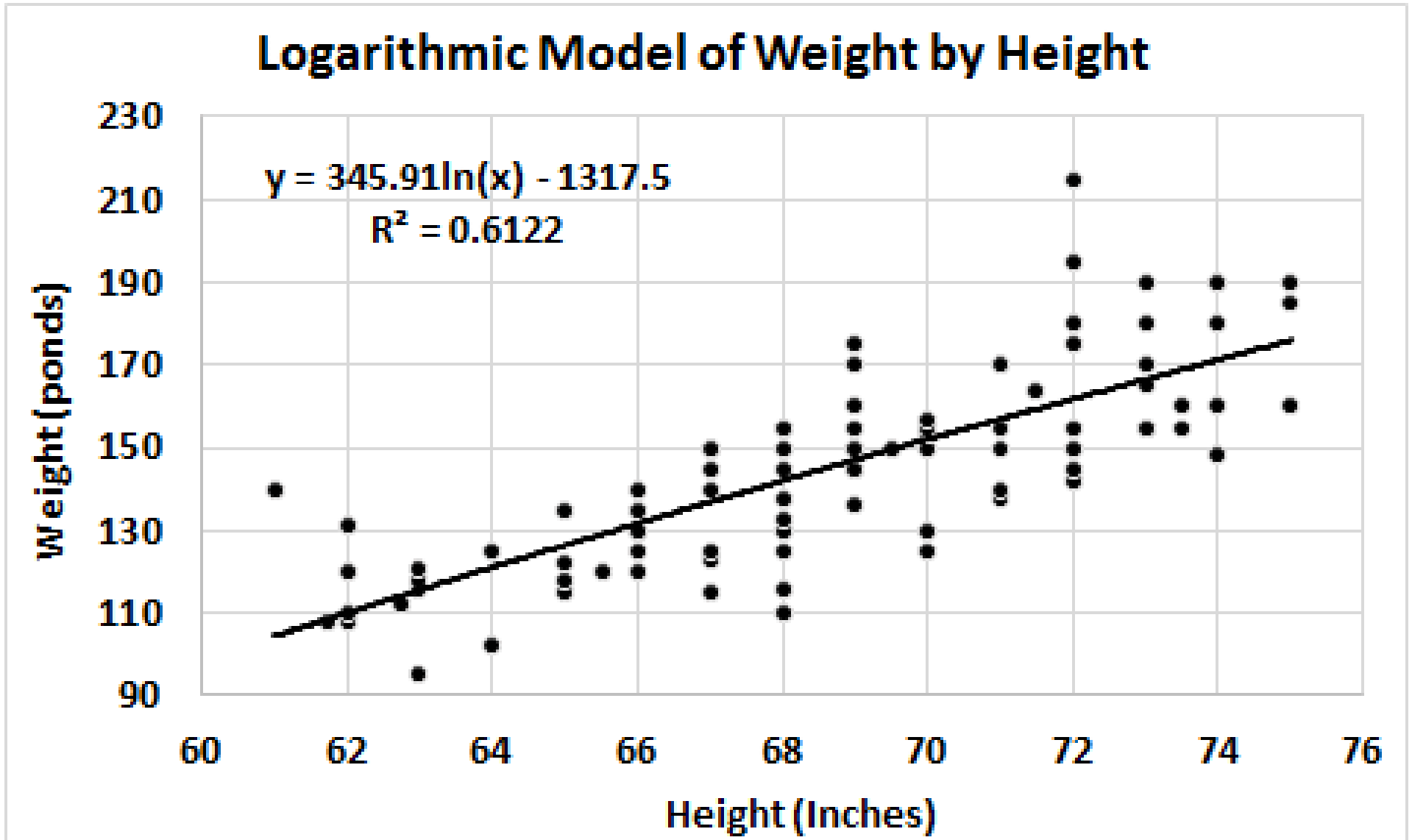
2) Linear Model: Intercept = 0



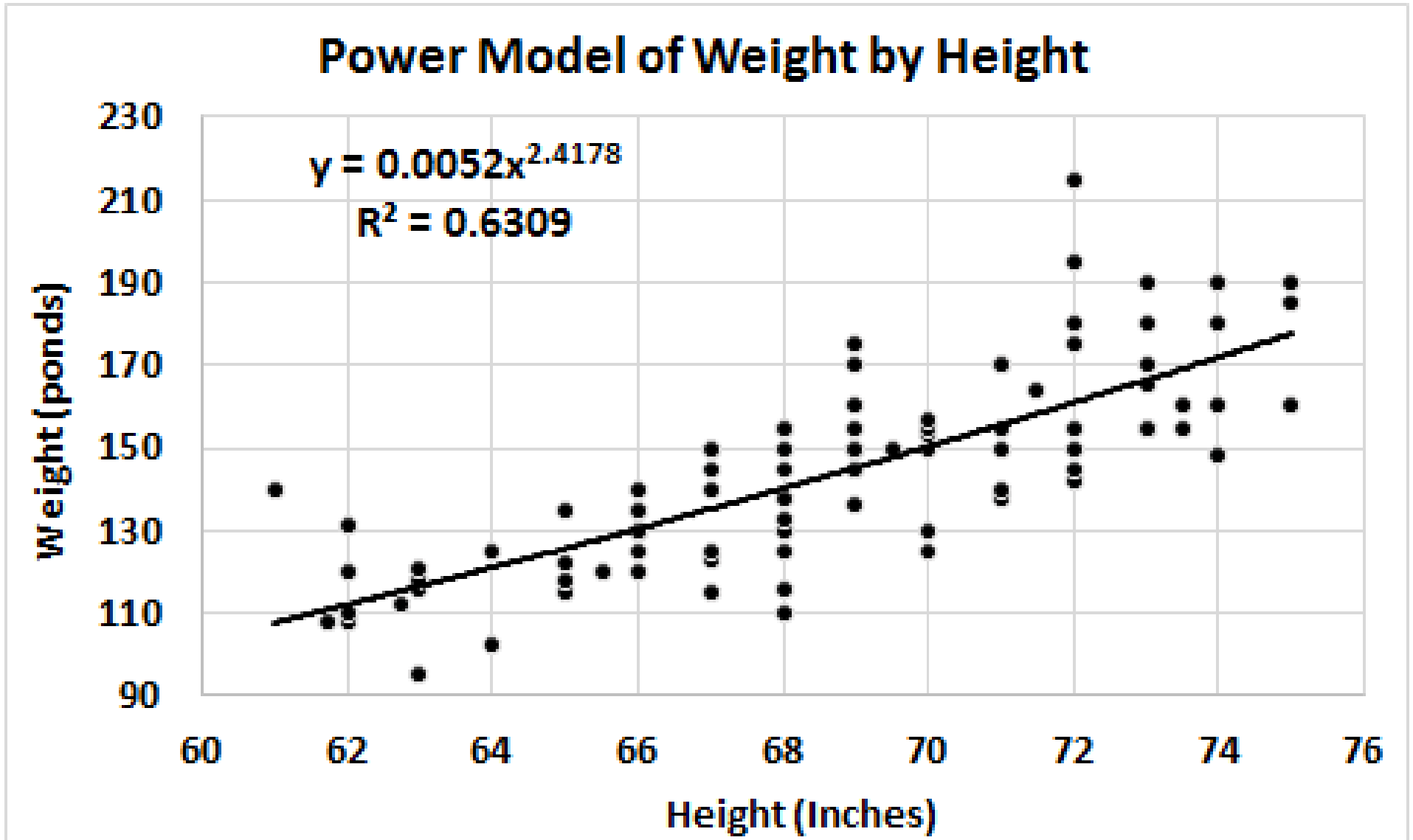
3) Polynomial Model



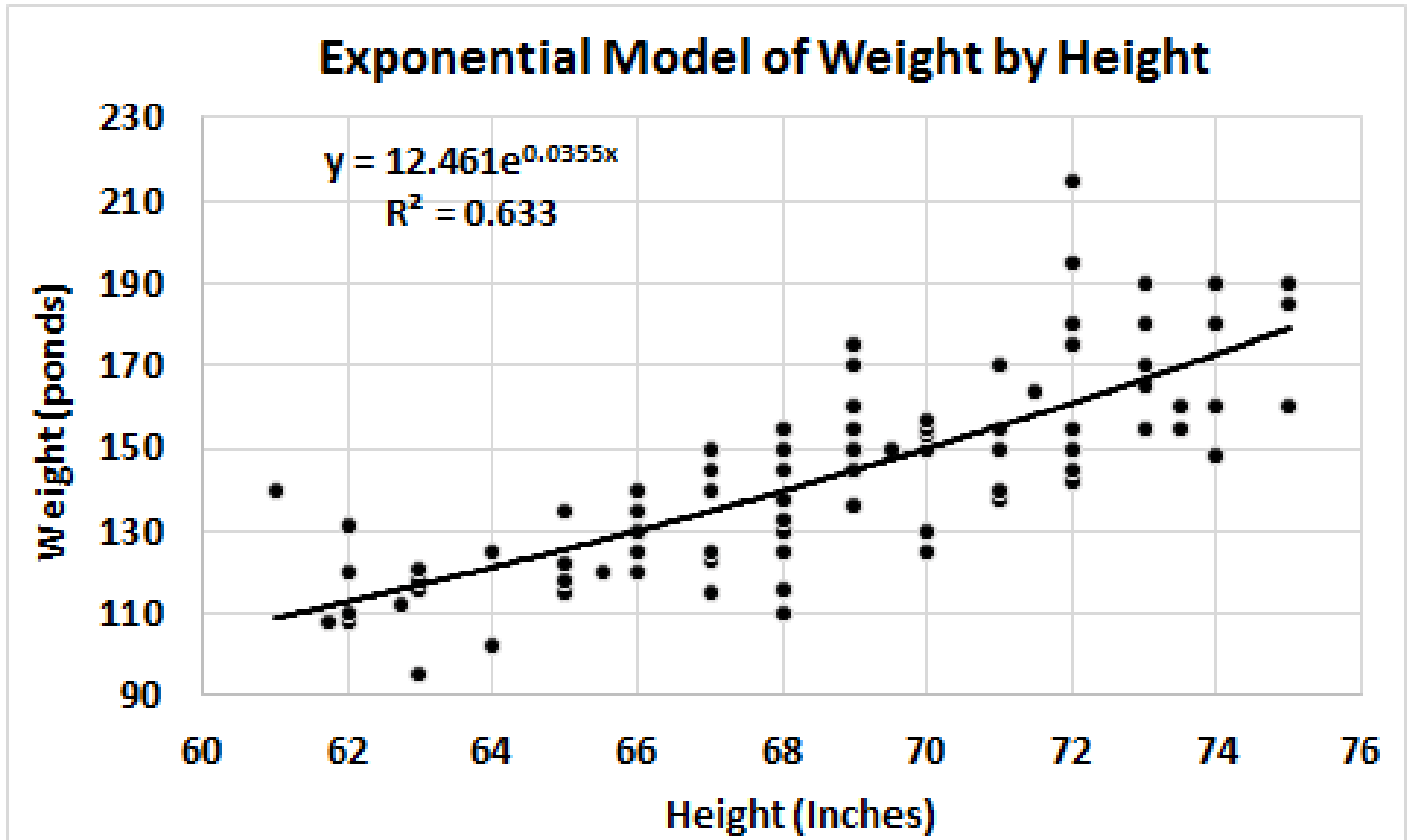
4) Logarithmic Model



5) Power Model



6) Exponential Model



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