Build Tasks

Use the linear model to predict a value, and identify interpolation vs. extrapolation.

1. The line of best fit for hours studied (x) vs test score (y) is $y = 6x + 40$. Predict the score for 7 hours of study.

2. A line of best fit for advertising spend ($x hundred) vs sales ($y thousand) is $y = 1.2x + 3$. Predict sales when $800 is spent ($x = 8$).

3. A gym's line of best fit for sessions attended (x) vs weight lost in kg (y) is $y = 0.4x + 1$. Predict weight lost after 15 sessions.

4. The data used to form a line of best fit ranged from $x = 0$ to $x = 20$. Is predicting y at $x = 7$ interpolation or extrapolation?

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Explain your reasoning about reliability, and find a line's equation from two points.

5. The data for hours studied vs score ranged from $x = 0$ to $x = 10$. Is predicting the score at $x = 25$ interpolation or extrapolation? Explain why this prediction is less reliable.

6. A line of best fit passes through $(2, 14)$ and $(6, 26)$. Find its gradient.

7. Using the line from Question 6, given its y-intercept is 8, write the equation of the line.

8. Use the equation from Question 7 to predict y when $x = 10$.

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Predict values in and beyond the data range, and explain confidence in a prediction.

9. A line of best fit for age (x, years) vs reaction time (y, ms) is $y = 3x + 150$, based on data for ages 10 to 18. Predict reaction time for a 14-year-old.

10. Using the same line, predict reaction time for a 40-year-old. Explain why you should be cautious about this prediction.

11. A scatter plot shows a weak correlation (points scattered widely around the line of best fit). Explain how this affects your confidence in a prediction made using the line.

12. Two students use the same line of best fit to predict a value at $x = 5$, within the data range. Student A says the prediction will definitely be exactly correct. Explain why Student A is wrong.