

# Grade 8 · Lines of Best Fit and Linear Models · Test Answer Key

Common Core 8.SP.A.2, 8.SP.A.3 · mathovore.fr

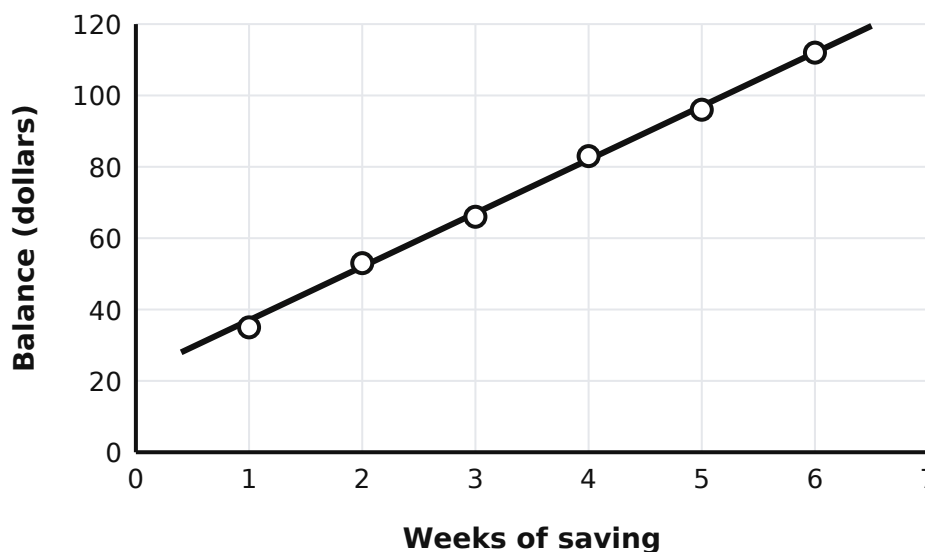
This answer key gives the worked solution and the scoring guide for each of the nine test questions. Award partial credit as described, and accept any correct method. The total is 20 points.

## Grade 8 Common Core: 8.SP.A.2 · 8.SP.A.3

### Question 1: Judge the fit (2 points)

(a) Gaps:  $-2, +1, -1, +1, -1, 0$ . **2 points above, 3 points below, 1 point on the line.**

(b) **Yes:** the largest gap is 2 dollars, and points are on both sides.



Dashed segments show the gaps, all 2 dollars or less.

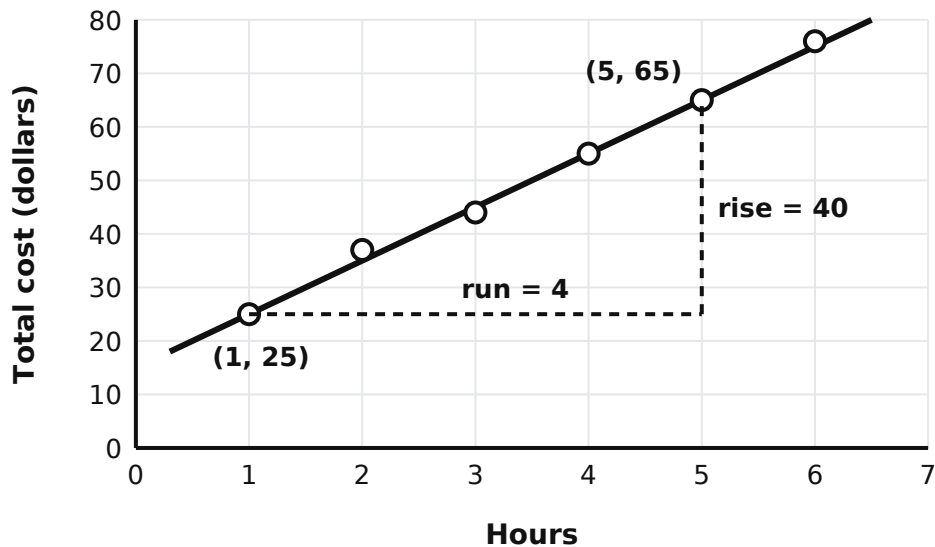
*Scoring: 1 point for the correct counts; 1 point for a correct judgment with a reason.*

### Question 2: Equation of the line (2 points)

$$\text{Slope: } m = \frac{65-25}{5-1} = \frac{40}{4} = 10.$$

Substitute (1,25):  $25 = 10(1) + b$ , so  $b = 15$ .

$$y = 10x + 15$$



Rise 40 over run 4 gives slope 10.

Scoring: 1 point for the slope; 1 point for the y-intercept and the equation.

### Question 3: Meaning in context (2 points)

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- (a) The cost goes up **\$12 for each additional hour**.
- (b) The cost is **\$8 when  $h = 0$** , which is a flat fee charged before any hours.

Scoring: 1 point for each correct interpretation in context.

### Question 4: Predict and compare (2 points)

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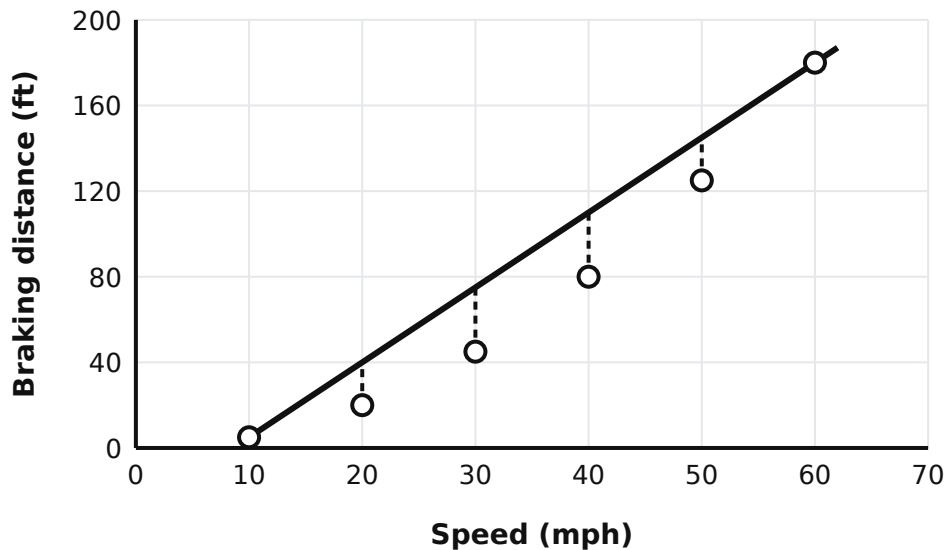
- (a)  $V = -2(6) + 26 = 14$ , so **\$14,000**.
- (b)  $15 - 14 = 1$ , so the sale price is **\$1,000 above** the prediction.

Scoring: 1 point for the prediction; 1 point for direction and amount.

### Question 5: Is a line appropriate? (2 points)

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- (a) The four middle points all lie **below the line** (by 20 to 30 feet), so the points curve.
- (b) **No**. The points follow a curve, so a straight line is a poor model.



Scoring: 1 point for describing the curved pattern; 1 point for a correct conclusion with a reason.

### Question 6: Better line (2 points)

Jamal's line predicts 5, 9, 13, 17, 21: gaps 0, 0, 1, 0, 1, total **2**.

Aisha's line predicts 5, 10, 15, 20, 25: gaps 0, 1, 3, 3, 5, total **12**.

**Jamal's line fits better.**

Scoring: 1 point for correct gaps for both lines; 1 point for the conclusion.

### Question 7: Candle model (3 points)

(a) The candle gets **0.8 inch shorter each hour**; it was **12 inches** long at the start.

(b)  $-0.8(7.5)+12=-6+12=6$ , so **6 inches**.

(c)  $-0.8t+12=0$ , so  $t=\frac{12}{0.8}=15$ : **15 hours**.

Scoring: 1 point per part.

### Question 8: Gaps and outlier (3 points)

(a) Predicted scores: 90, 85, 80, 75, 70, 65. Gaps: +1, -1, 0, -15, +1, -1.

(b) The outlier is (4,60), which is 15 points below the line.

*Scoring: 2 points for the six predictions and gaps (1 point if one or two are wrong); 1 point for the outlier.*

### **Question 9: Reliable prediction? (2 points)**

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(a)  $T = -0.5(70) + 30 = -35 + 30 = -5$  minutes.

(b) A time cannot be negative, and 70 weeks is far outside the data (1 to 8 weeks), so the linear model no longer applies.

*Scoring: 1 point for the computation; 1 point for a valid reason.*

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| <b>Total</b>     |
| <b>20 points</b> |