

Fitting Lines to Data and Making Predictions

Grade 8 math · Test Answer Key · Standards: 8.SP.A.2, 8.SP.A.3

Award points as shown in each scoring note. Accept equivalent forms of an equation, and accept any interpretation that states the unit of change and the direction, such as increases or decreases.

Standards: 8.SP.A.2, 8.SP.A.3 · **Level:** Grade 8

Question 1 Use a model (2 points)

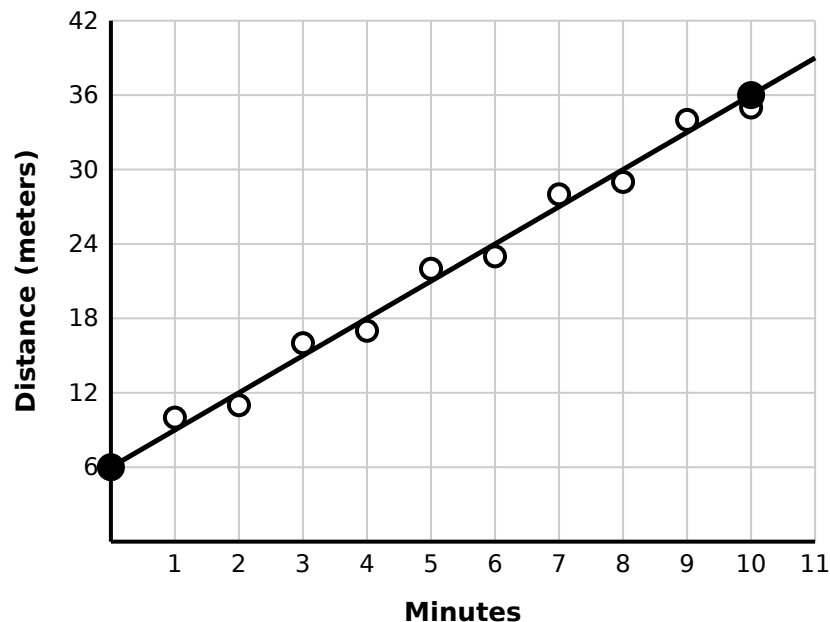
(a) $6 \cdot 9 + 14 = \mathbf{68}$

(b) $6x + 14 = 104$, so $6x = 90$ and $x = \mathbf{15}$

Scoring: 1 point per part.

Question 2 Read a trend line (3 points)

(a) The line passes through (0, 6) and (10, 36). Slope: $(36 - 6) \div 10 = 3$; intercept: 6.



Slope = $(36 - 6) \div 10 = 3$; intercept = 6.

(b) $y = \mathbf{3x + 6}$

(c) $3 \cdot 14 + 6 = \mathbf{48 \text{ meters}}$

Scoring: 1 point per part.

Question 3 Meaning in context (3 points)

- (a) The tank loses **2.5 gallons each minute**.
- (b) The tank starts with **90 gallons**.
- (c) $-2.5x + 90 = 0$, so $x = 90 \div 2.5 = \mathbf{36 \text{ minutes}}$.

Scoring: 1 point per part.

Question 4 Choose the better line (3 points)

- (a) **Line A**
- (b) Line A passes close to every point and has points on both sides. Line B starts above the points on the left and falls below them on the right, so it misses the trend (its slope 0.5 is much smaller than the rise of the data).

Scoring: part (a) 1 point; part (b) 1 point per valid reason.

Question 5 Equation from two points (3 points)

- (a) $(43 - 19) \div (8 - 2) = 24 \div 6 = \mathbf{4}$
- (b) $19 = 4 \cdot 2 + b$, so $b = 11$: **$y = 4x + 11$**
- (c) $4 \cdot 12 + 11 = \mathbf{59}$

Scoring: 1 point per part.

Question 6 Trusting a prediction (2 points)

The line is based on ages from 0 to 12 months. Ten years is far outside that range, and growth slows down, so the straight-line trend does not continue.

This is extrapolation far beyond the data; 140 inches is unrealistic

Scoring: 1 point for naming extrapolation, 1 point for a reason.

Question 7 Bracelet sales (2 points)

- (a) About **1.5 bracelets are sold each day**.
- (b) $1.5 \cdot 20 + 8 = \mathbf{38 \text{ bracelets}}$

Scoring: 1 point per part.

Question 8 Candle burning (2 points)

$$-0.75x + 18 = 6, \text{ so } -0.75x = -12.$$

$$x = 12 \div 0.75 = 16.$$

After 16 hours

Scoring: 1 point for the equation, 1 point for the solution.