

## 1.1 Modeling &amp; Equation Solving

Review Target: Connecting Numeric, Algebraic, and Graphical Models

Review of Prior Concepts

Which of the following equations represents the linear relationship between time,  $t$ , and velocity,  $v$ , shown in the table below?

$t$	0	1	2
$v$	120	152	184

A.  $v = 32t$    B.  $v = 32t + 120$    C.  $v = 120t$    D.  $v = 120t + 32$    E.  $v = 120t + 120$

$v(0) = 120$ , so not A, C, or D

$$\text{slope} = \frac{\Delta v}{\Delta t} = \frac{152 - 120}{1 - 0} = 32, \text{ so B}$$

## More Practice

## Data and Linear Relationships

<http://www.mathplanet.com/education/algebra-1/formulating-linear-equations/scatter-plots-and-linear-models>

<https://www.youtube.com/watch?v=sa7hGpfdUzM>

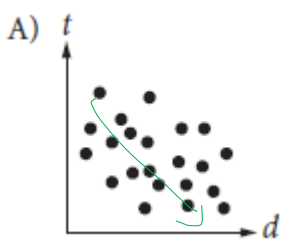
## SAT Connection

## Problem Solving and Data Analysis

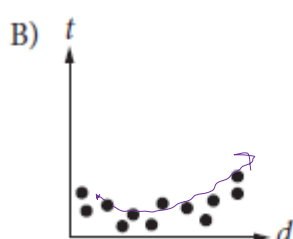
4. Given a scatterplot, use linear, quadratic, or exponential models to describe how the variables are related.

Example:

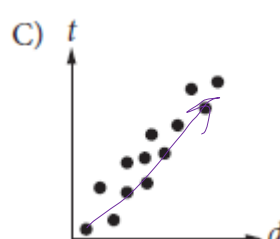
Which of the following graphs best shows a strong negative association between  $d$  and  $t$ ?



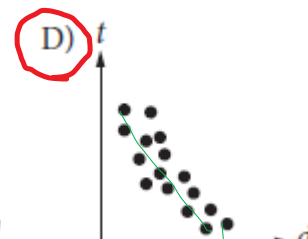
negative  
spaced out,  
so weak



positive



positive

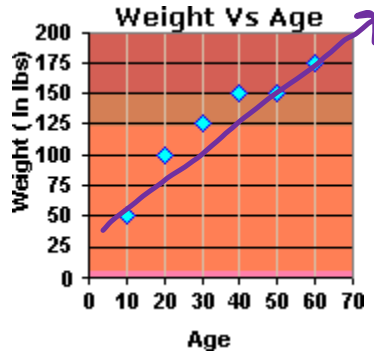


negative  
close together,  
so strong

Solution

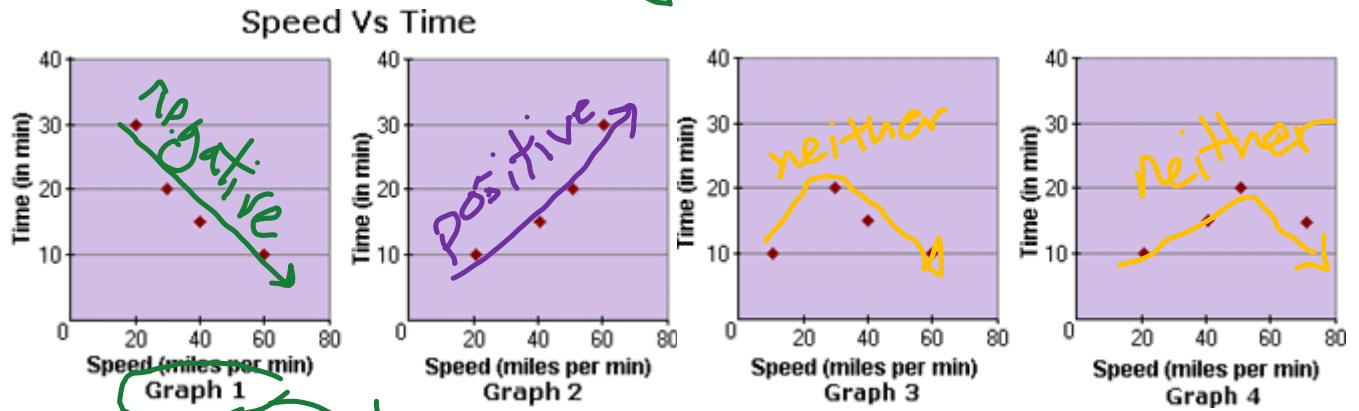
**Graphical Models and Trends**

Example: What sort of trend is shown in the scatter plot?



- A. No trend   B. Negative trend   C. Constant trend   **D. Positive trend**

Example: Which scatter plot shows the negative relationship between the times taken to reach City A from City B at different speeds?



- A. Graph 3   **B. Graph 1**   C. Graph 4   D. Graph 2

**More Practice**

**Interpreting Data**  
<https://www.ixl.com/math/algebra-1/interpret-a-scatter-plot>  
<https://www.youtube.com/watch?v=CWnfwZRAuaY>

**SAT Connection**  
**Solution**

**Choice D is correct.** A graph with a strong negative association between  $d$  and  $t$  would have the points on the graph closely aligned with a line that has a negative slope. The more closely the points on a graph are aligned with a line, the stronger the association between  $d$  and  $t$ , and a negative slope indicates a negative association. Of the four graphs, the points on graph D are most closely aligned with a line with a negative slope. Therefore, the graph in choice D has the strongest negative association between  $d$  and  $t$ .

Choice A is incorrect because the points are more scattered than the points in choice D, indicating a weak negative association between  $d$  and  $t$ . Choice B is incorrect because the points are aligned to either a curve or possibly a line with a small positive slope. Choice C is incorrect because the points are aligned to a line with a positive slope, indicating a positive association between  $d$  and  $t$ .