District Cards Answer Key

District 7: Timber Key

Vertex of Parabola: 35

\[ y = a(x - h)^2 + k \]
\[ a = 0.09 \]

<table>
<thead>
<tr>
<th>Year</th>
<th>Timber Exports in Thousands of Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>106</td>
</tr>
<tr>
<td>2040</td>
<td>34</td>
</tr>
<tr>
<td>2050</td>
<td>25</td>
</tr>
<tr>
<td>2060</td>
<td>34</td>
</tr>
<tr>
<td>2070</td>
<td>61</td>
</tr>
<tr>
<td>2080</td>
<td>106</td>
</tr>
<tr>
<td>2100</td>
<td>250</td>
</tr>
</tbody>
</table>

Possible Student Procedure
1. Graph the points in the table.
2. Use the vertex in the graph to plug in for \( h \) and \( k \).
3. Use a point in the table to plug in for \( x \) and \( y \).
4. Solve for \( a \).
5. Use an equation to graph parabola.

Correct Graph

District 10: Livestock Key

Slope or \( m \): 12

<table>
<thead>
<tr>
<th>Year</th>
<th>Cattle Head Exports by the Thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>242.4</td>
</tr>
<tr>
<td>2030</td>
<td>243.5</td>
</tr>
<tr>
<td>2040</td>
<td>244.8</td>
</tr>
<tr>
<td>2050</td>
<td>246</td>
</tr>
<tr>
<td>2060</td>
<td>247.2</td>
</tr>
<tr>
<td>2070</td>
<td>248.4</td>
</tr>
<tr>
<td>2080</td>
<td>249.6</td>
</tr>
<tr>
<td>2090</td>
<td>250.8</td>
</tr>
<tr>
<td>2100</td>
<td>252</td>
</tr>
</tbody>
</table>

Possible Student Procedure
1. Graph the points in the table.
2. Locate the slope
   a. Rise over Run
   b. Calculator
3. Use the slope to predict 2100’s numbers.
4. Write an equation to represent the graph.

Correct Graph

District 12: Coal Key

Slope or \( m \): -0.04 \( b = 500 \)

<table>
<thead>
<tr>
<th>Year</th>
<th>Coal Exports by the Ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>2055</td>
<td>417.8</td>
</tr>
<tr>
<td>2060</td>
<td>417.6</td>
</tr>
<tr>
<td>2065</td>
<td>417.4</td>
</tr>
<tr>
<td>2070</td>
<td>417.2</td>
</tr>
<tr>
<td>2075</td>
<td>417</td>
</tr>
<tr>
<td>2080</td>
<td>416.8</td>
</tr>
<tr>
<td>2085</td>
<td>416.6</td>
</tr>
<tr>
<td>2090</td>
<td>416.4</td>
</tr>
<tr>
<td>2095</td>
<td>416.2</td>
</tr>
</tbody>
</table>

Possible Student Procedure
1. Graph the points in the table.
2. Locate the slope
   a. Rise over Run
   b. Calculator
3. Use the slope and a point in the table to solve for \( b \).
4. Use the equation to predict the year 2085.
5. Write an equation to represent the graph.

Correct Graph
Natural Resources of Panem Answer Key

Directions:
1. Each group will receive a Panem District Card,
2. Cards will provide a data table and basic information about the District and how it supports the Capitol.
3. In your groups, work collaboratively to answer the questions below.
4. You may use a calculator and any tools needed to support your thinking and process.

District #: _____ will vary
Industry/ Natural Resource: __ will vary

Generalizations about the Data Provided:
Student answers will vary. Ideally, we’re looking for trends such as….
- Production is increasing over time.
- Production is decreasing over time.
- Production is inconsistent.
- Production drops and then recovers.
- Also, ideas as to why production is trending this way such as…
  - ….. has an abundance of resources
  - ….. is managing their resources well.
  - ….. had bad weather for a few years and production slowed
Graph: You may use this one, or paste your own on TOP! See District Cards Answer Key

1. What type of data did your graph produce?
   a. Student answers will vary. Ideally, we're looking for a positive slope, negative slope, and a parabola.

2. What equation was used to represent your data?
   a. District 7: Parabola (Quadratic Function)
   b. District 12: Linear Function (Declining)
   c. District 10: Linear Function (Increasing)
   d. My Notes from Class Discussion

Student notes will vary.
Directions: Answer the following question using complete sentences. Be sure to provide support for your claim(s).

Why do you feel the Capitol divided the old states “Districts” with a focus on natural resources?

Using the checklist below for grading, student answers may vary but should be reasonable and explained with relevant details.

Success Criteria for Grading

I have answered the question. (1 pt)
I have provided at least 2 reasons to support my response. (2 pts)
I have used at least 2 of my vocabulary words accurately in my response. (1 pt)
I have used complete sentences in my response. (1 pt)
End Assessment Answer Key

Directions: Answer the following using complete sentences. Be sure to provide support for your claim.

President Snow has declared District 11 will be split in 2 Districts. The Western side of the Mississippi (District 11.1) will continue to farm and provide agriculture for the Capitol. The Eastern side of the Mississippi (District 11.2) will now focus on oil production. How might this split of the larger District 11 impact the region and its surrounding environment? (5 points)

Using the checklist below for grading, student answers may vary but should be reasonable and explained with relevant details

Success Criteria for Grading

I have answered the question. (1 point)
I have provided at least 2 reasons to support my response. (2 points)
I have used at least 2 of my vocabulary words accurately in my response. (1 point)
I have used complete sentences in my response. (1 point)

1. In District 11.2, the Capitol has tracked the first 12 months of the oil barrel shipments they have received. Based on the table, please complete the following for the Capitol’s analysis: (15 points)
   a. A graph of oil production. (9 points)
   b. An algebraic expression to represent the trend. (2 points)
   c. A prediction for the oil production (if the data continues at this rate for the end of the 2\textsuperscript{nd} year. (2 points)
   d. An explanation on how I know the above is correct. (2 points)

- Titles may vary, but should include District 11.2 oil production. X axis = Month and Y = Oil Barrels by thousands
  o Students should see they need to count by different values along x and y axis. As long as their values are consistent for each axis, use your discretion when grading points accuracy.
  o Points and lines will vary based on how students label. Line should slope up to the right.
- Expression should be \( y = 2x + 4 \)
- Students can plug in ANY coordinate pair from the table to prove this to be true.
- Prediction for the 2\textsuperscript{nd} year should be 52 thousand barrels.
- Students can prove this prediction by continuing the table until 24 months, or by solving for \( y \) in their expression.
- Students should explain in words how they solved the problem. Teacher discretion used to award points for explanation.

Success Criteria for Grading

I have titled my graph. (1 point)
I have labeled my x and y axis (2 points)
I have graphed the points correctly (5 points)
I have connected the dots on my graph. (1 point)
I have written an expression using variables for x and y (1 point)
I have proven my expression to be true (1 point)
I have made a prediction for the 2nd year of oil production (1 point)
I have proven my prediction for the 2nd year of oil production (1 point)
I have explained how I know my information to be true (2 points)

**Vocabulary Test Answer Key**

<table>
<thead>
<tr>
<th></th>
<th>1. linear function</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>1. linear function</td>
</tr>
<tr>
<td>E</td>
<td>2. natural resource</td>
</tr>
<tr>
<td>C</td>
<td>3. thermal expansion</td>
</tr>
<tr>
<td>B</td>
<td>4. cost benefit analysis</td>
</tr>
<tr>
<td>A</td>
<td>5. economic advantage</td>
</tr>
</tbody>
</table>