

Algebra 1 SOL Review Session – Day 7

Topics

1. Line and Curve of Best Fit
2. Writing the Equation of a Line
3. Radicals

1. Line and Curve of Best Fit

Collecting data, writing the equation of a line/curve that best fits the data, making predictions.

Step 1: Make a scatter plot of the data.

- Go to DESMOS, click “start graphing”
- Click the plus sign in the upper left corner to insert a table
- Type in the data
- Look at the graph to see the shape the points are making

Step 2: Calculate the equation of the line/curve of best fit.

- Line of Best Fit
 - o Type $y_1 \sim mx_1 + b$ (if the points are making the shape of a line)
 - o Find your “m” and “b” values and plug them into $y = mx + b$
- Curve of Best Fit
 - o Type $y_1 \sim ax_1^2 + bx_1 + c$ (if the points are making the shape of a parabola)
 - o Find your “a”, “b”, and “c” values and plug them into $y_1 \sim ax_1^2 + bx_1 + c$

Step 3: Check the r^2 value

- The value is known as the coefficient of determination. It will determine how strong the correlation is between x and y.
- The closer the value is to 1, the stronger the correlation.

Guided Practice

Using the quadratic curve of best fit, which equation most closely represents the set of data?

$\{ (-8, 80.4), (-7, 57.8), (-6, 38.6), (-5, 22.8), (3, 18.8), (5, 51.8), (7, 98.4) \}$

- ☐ A. $y = x^2 + 2x - 5$
- ☐ B. $y = x^2 - 3x + 5.2$
- ☐ C. $y = 1.7x^2 - 3x + 5$
- ☐ D. $y = 1.7x^2 + 2.9x - 5.2$

This table shows the number of months used and the approximate distances driven, in miles, for six buses in a school district.

Buses

Bus	Months Used	Distances Driven (miles)
Bus A	6	10,100
Bus B	10	17,000
Bus C	12	23,900
Bus D	15	31,500
Bus E	20	43,200
Bus F	27	59,900

Using the line of best fit for these data, which value is the best prediction of the distance driven, in miles, by a bus that has been used for 40 months?

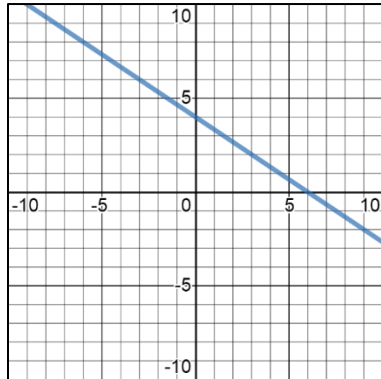
- ☐ A. 68,000
- ☐ B. 79,100
- ☐ C. 86,400
- ☐ D. 91,400

2. Writing the Equation of a Line

- **Given a graph:** identify slope and y-intercept, plug into $y = mx + b$
- **Given slope and y-intercept:** plug given values into $y = mx + b$
- **Given two points:** use DESMOS and follow instructions for finding line of best fit
- **Passes through a point and is parallel to given line:** using $y = mx + b$, plug in “x” and “y” from given point, and use the same slope as the given line and plug in for “m”; solve for “b”; plug in “m” and “b” values into $y = mx + b$
- **Passes through a point and is perpendicular to given line:** using $y = mx + b$, plug in “x” and “y” from given point, and use the opposite reciprocal slope of the given line and plug in for “m”; solve for “b”; plug in “m” and “b” values into $y = mx + b$

Guided Practice

Which equation best represents the line graphed below?



- A) $y = x + 6$ B) $y = 4$
C) $2x + 3y = 12$ D) $3x + 2y = 12$

What is the equation of a line with a slope of $-\frac{3}{5}$ and y-intercept of -7 ?

What is the equation of a line that passes through points $(-3, 14)$ and $(5, 6)$?

What is the equation of a line that is perpendicular to $y = 4x - 11$ and passes through $(-8, 7)$?

What is the equation of a line that is parallel to $y = -3x + 1$ and passes through $(-1, -7)$?

3. Radicals (how to check your answer in DESMOS)

- Enter the radical in DESMOS ($y = \text{radical}$). If the radical contains variables, use x for all variables.
- You will notice that DESMOS provides a decimal value for the radical and a graph of the radical.
- For multiple choice questions, enter each answer choice into DESMOS
- The decimal value and the graph of the original radical and its correct answer will match.
- There may be more than one multiple-choice option whose decimal/graph matches the decimal/graph for the original radical. Of the matching options, choose the one that has the SMALLEST number under the radical sign.

Guided Practice

<p>What is $\sqrt[3]{3,456}$ in simplest form?</p> <p><input type="radio"/> A. $2\sqrt[3]{12}$</p> <p><input type="radio"/> B. $6\sqrt[3]{16}$</p> <p><input type="radio"/> C. $12\sqrt[3]{2}$</p> <p><input type="radio"/> D. $24\sqrt[3]{6}$</p>	<p>which expression is equivalent to $\sqrt{180x^9y^{16}}$ in simplest form?</p> <p><input type="radio"/> A. $3x^3y^4\sqrt{20}$</p> <p><input type="radio"/> B. $3x^4y^8\sqrt{20x}$</p> <p><input type="radio"/> C. $6x^3y^4\sqrt{5}$</p> <p><input type="radio"/> D. $6x^4y^8\sqrt{5x}$</p>
<p>For which value of x does $\sqrt[3]{x}$ simplify to $5\sqrt[3]{7}$?</p> <p><input type="radio"/> A. 35</p> <p><input type="radio"/> B. 245</p> <p><input type="radio"/> C. 875</p> <p><input type="radio"/> D. 1715</p>	<p>Drag the answer to the correct boxes. Each answer may be used more than one time.</p> <p>Complete this equation to create a true statement.</p> $4\sqrt{2} \cdot 2\sqrt{3} = \boxed{}\sqrt{\boxed{}}$ <div><div>2</div><div>4</div><div>5</div><div>6</div><div>8</div><div>10</div></div>
<p>Directions: Click on all the correct answers.</p> <p>Identify each expression that is in simplest radical form.</p> <div><div>$x\sqrt{50y}$</div><div>$64\sqrt{x}$</div><div>$7x^2y\sqrt{2xy}$</div><div>$\sqrt{12x^3y^4}$</div></div>	

