

ANSWER PRESENTATION TOOL

Algebra 2 - Student Edit

2

4- Practice

21-31

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21. Step 1 The input values are equally spaced. So, analyze the differences in the outputs to determine what type of function you can use to model the data.

$S(0)$	$S(1)$	$S(2)$	$S(3)$
0	180	720	1620
\	/	\	/
-180	-540	-900	
\	/	\	/
	360	360	

Because the second differences are constant, you can model the data with a quadratic function.

Step 2 Write a quadratic function of the form $S(C) = aC^2 + bC + c$ that models the data. Use any three points (C, S) from the table to write a system of equations.

Use $(0, 0)$: $c = 0$

Use $(1, 180)$: $a + b + c = 180$

Use $(2, 720)$: $4a + 2b + c = 720$

Use the elimination method to solve the system.

$$2a + 2b = 360$$

$$4a + 2b = 720$$

$$-2a = -360$$

$$a = 180$$

$$b = 0$$

$$c = 0$$

The data can be modeled by the function $S(C) = 180C^2$.

Step 3 Evaluate the function when $C = 10$.

$$S(10) = 180(10)^2 = 18,000$$

The safe working load is 18,000 pounds.

23. Using technology, create a scatter plot. The data show a quadratic relationship. Find the quadratic equation. The values in the equation can be rounded to obtain

$$f(x) = 0.026x^2 - 0.016x + 1.6 \text{ with } R^2 = 0.9979.$$

$$f(32) = 0.026(32)^2 - 0.016(32) + 1.6 = 27.7$$

So, the number of users after 32 weeks is about 27,700 users.

25. intercept form; The three points can be substituted into the intercept form of a quadratic equation to solve for a , and then the equation can be written. This method involves fewer steps than writing and solving a system of three equations, although it can only be used when given the intercepts.

27. a.

$y(0)$	$y(1)$	$y(2)$	$y(3)$
0	45	90	135
	↙ ↘	↙ ↘	↙
	45	45	45

The first differences are constant, so the data can be modeled using a linear model.

b. Write a linear equation of the form $y = ax + b$ that models the data. Use any two points (x, y) from the table to write a system of equations.

Use $(0, 6)$: $b = 0$

Use $(1, 45)$: $a + b = 45$

The solution of the system is:

$$a = 45$$

$$b = 0$$

The data can be modeled by the equation $y = 45x$.

Evaluate the function when $x = 6$.

$$y = 45(6) = 270$$

The distance is 270 miles.

29.

$y(0)$	$y(5)$	$y(10)$	$y(15)$	$y(20)$
470	630	690	650	510
\	/	\	/	/
-160	-60	40	140	
\	/	\	/	
-100	-100	-100		

The second differences are constant, so the data set can be modeled by a quadratic equation. Write a quadratic equation of the form $y = ax^2 + bx + c$ that models the data. Use any three points (x, y) from the table to write a system of equations.

Use $(0, 470)$: $c = 470$

Use $(5, 630)$: $25a + 5b + c = 630$

Use $(10, 690)$: $100a + 10b + c = 690$

Use the elimination method to solve the system.

$$25a + 5b = 160$$

$$50a + 5b = 110$$

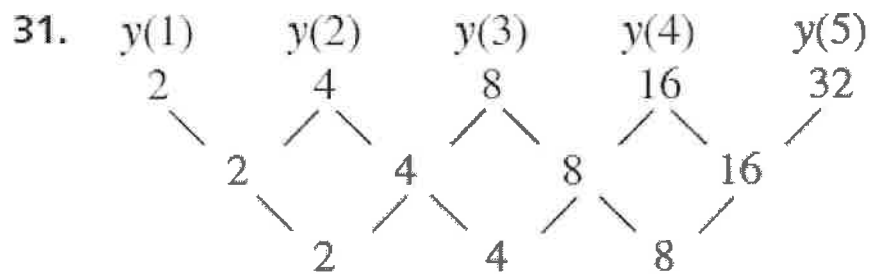
$$-25a = 50$$

$$a = -2$$

$$b = 42$$

$$c = 470$$

The data can be modeled by the equation
 $y = -2x^2 + 42x + 470$.



Neither the first or second differences are constant, so the data cannot be modeled by either a linear or quadratic equation.

