1	Option A is correct	To determine the function that represents the relationship shown in the table, the student could have used the slope-intercept form of a linear equation (*y* = *mx* + *b*, where —— represents the slope of the line and *b* represents the value of the *y*-intercept). The student first could have substituted the *x*- and —— – –, into *y* = *mx* + *b* and solved for *b*: – , – –

2	decreases, 0.25	To

4	Option D is correct	To determine the value of *x*, the student could have modeled the equation by using the formula for the area of a rectangle (*A* = *bh* where *A* is the area of the rectangle, *b* is the length of the base of the rectangle, and *h* is the height of the rectangle) and the formula for the area of a triangle (– , where *A* is the area of the triangle, *b* is the –

8	Option D is correct	To determine which statement is true, the student could have first found the factors (numbers or expressions that can be multiplied to get another number or expression) of $4x^2$ ς $36x + 81$. The student could have recognized that $4x^2$ and 81 represent perfect squares (numbers made by squaring whole numbers). Using this, the student could have –

9	*y*, 0 or 0, *y*	To determine the equation of the asymptote (a line that a curve approaches), the student could have used a graphing calculator to generate the graph of $y = 16(0.75)^x$. Since the graph is an exponential curve that extends forever to the left and the right and never crosses the *x*-axis (horizontal axis), the equation of the asymptote of the graph is $y = 0$. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

10	Option C is correct	To determine the equivalent expression, the student could have applied the power of a power property ($(a^m)^n = a^{mn}$), resulting in

13	Option A is correct	To determine the best estimate for the miles per gallon when the speed is 65 miles per hour, the student could have first used a graphing calculator to generate the function using quadratic regression (a method of determining a quadratic function, $y = ax^2 + bx + c$, where a, b, and c are real numbers). The quadratic function that best models the data is $y = \varsigma 0.00734x^2 + 0.689x + 14.115$. Next, the student could have substituted 65 for x in the function and solved for y, resulting in $y = \varsigma 0.00734(65)^2 + 0.689(65) + 14.115 = 27.8885$. Therefore, 27.9 represents the best estimate for the miles per gallon when the speed is 65 miles per hour. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option B is incorrect	The student likely generated the function using a linear regression (a method of determining a linear function, $y = mx + b$, where m represents the slope of the linear function and b represents the y-intercept), resulting in $y = 0.096x + 24.807$. Next, the student likely substituted 65 for x in the function and solved for y, resulting in $y = 0.096(65) + 24.807 = 31.047$. The student needs to focus on understanding how to write a quadratic function that was generated using quadratic regression.
	Option C is incorrect	The student likely generated the function using a linear regression using only the first two ordered pairs in the table, resulting in $y = 0.34x + 18.1$. Nex7 433k[(5 (ex1433k[(5 7 (stu)-6 (n1433k3 Tm[ke fiely433k sub)15k[(itu

18	Option B is correct	To determine which statement is true, the student could have used a graphing calculator to generate the graph of $p(x) =$ ς$7(4)^x$. Since the graph is an exponential curve that extends infinitely to the left and the right, the domain (all possible x-values) is all real numbers. No matter which x-value is chosen, its corresponding y-value is negative; therefore, the range (all possible y-values) is all real numbers less than 0. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely identified the base (value of b in an exponential function in the form of $p(x) = ab^x$) of the exponential function, $b = 4$, as representing the lower boundary of the domain of the function. The student needs to focus on understQ21 609.82 Tm[(efficien)3 (t)7 (way)6.

21	Option A is correct	To determine which statement is true, the student could have recognized that the equation of a vertical line can be written as $x = a$, where a is the value where the line intersects (crosses) the x-axis (horizontal axis). Therefore, the equation of the line is x = ς4. To determine the slope (steepness of a straight line when graphed on a coordinate grid, represented by ——), the student should have chosen two points on the line and substituted the corresponding values in the equation for the slope of a line. Using (ς4, 0) and (ς4, 2), —— –, [illegible] possible. This is an efficient way to solve the problem; however, oe ,

24	Option A is correct	To determine which expressions are equivalent to $12x^2 - 48x + 48$, the student could have found the factors (numbers or expressions that can be multiplied to get another number or expression) of the expression. The student could have first factored out the greatest common factor (largest factor that divides evenly into all the terms), 12, from each term, resulting in $12(x^2 - 4x + 4)$. Next, the student could have recognized that x^2 is equal to x times x and written x as the first term in each factor. The student could then have determined that the second terms in the factors are -2 and -2 because their product (answer when multiplied) is 4 and their sum (answer when added) is -4. The student could have then written the factors as $12(x - 2)(x - 2)$, or $12(x - 2)^2$. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option E is correct	To determine which expressions are equivalent to $12x^2 - 48x + 48$, the student could have found the factors of the expression. The student could have first factored out the greatest common factor, 12, from each term, resulting in $12(x^2 - 4x + 4)$. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option B is incorrect	The student likely made a sign error when factoring out the greatest common factor from each term, resulting in $-12(x^2 + 4x + 4)$. The student needs to focus on understanding how to factor an expression of the form $ax^2 + bx + c$.
	Option C is incorrect	The student likely determined that two factors of x^2 are x and x and that two factors of 4 are -4 and -1 but disregarded the value of the linear term of the quadratic equation, resulting in $12(x - 4)(x - 1)$. The student needs to focus on understanding how to factor an expression of the form $ax^2 + bx + c$.
	Option D is incorrect	The student likely made a sign error when factoring out the greatest common factor from each term, resulting in $-12(x^2 + 4x + 4)$. Next, the student likely determined that the first term in each factor is x and that the second term in each factor is 2, resulting in $-12(x + 2)(x + 2)$, or $-12(x + 2)^2$. The student needs to focus on understanding how to factor an expression of the form $ax^2 + bx + c$.

27	Option D is correct	To determine what 1.029 represents in the function $w(t) = 270(1.029)^t$, the student should have recognized that in an exponential function $w(t) = ab^t$, a represents the initial value (starting value), b is the common factor (constant rate by which successive values increase or decrease), and t is the variable (symbol used to represent an unknown number). In this situation, the variable t represents the number of years. In $w(t) = 270(1.029)^t$, the student should have recognized that the initial number of whales is 270 since $a = 270$. The student should have also recognized that the number of whales are increasing at a rate of 2.9% per year since $b = 1.029$ and that 1.029 represents the growth factor of the number of whales since $1.029 > 1$.
	Option A is incorrect	The student likely interpreted $b = 1.029$ as the initial number of whales in the North Atlantic Ocean, instead of recognizing that $b = 1.029$ is a growth factor since $b > 1$ and that $a = 270$ is the initial value. The student needs to focus on interpreting the meaning of the values of a and b of an exponential function in the form $w(t) = ab^t$.
	Option B is incorrect	The student likely interpreted $b = 1.029$ as the decay factor of the number of whales in the North Atlantic Ocean, which indicates a decrease of 2.9% per year

28	Option C is correct	To determine the slope (steepness of a straight line graphed on a coordinate grid) of the line, the student could have used the given ordered pairs and applied the slope formula, Substituting the *x*-values and *y*-values of (−2, −2) and (4, 2) into the slope formula, the student could have calculated

29	Option B is correct	
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30	Option D is correct	To determine the best estimate of the price of a discounted ticket for the baseball game, the student could have graphed the first equation and the second equation on the same coordinate plane and estimated the coordinates of the point where the two lines intersect (cross) given the graph of the first equation. The student then could have estimated that the two lines intersect at (13.95, 11.15). Since *y* represents the price of a discounted ticket in dollars, the student could have concluded that the price of a discounted ticket is $11.15. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely estimated the price of a standard ticket instead of estimating the price of a discounted ticket, resulting in $13.95. The student needs to focus on interpreting the point of intersection of two intersecting lines.
	Option B is incorrect	The student likely overestimated the price of a standard ticket instead of estimating a discounted ticket, resulting in $14.55. The student needs to focus on estimating the solution to a system of equations using the graphing method.
	Option C is incorrect	The student likely divided the total amount of ticket sales by the sum (answer when added) of the number of standard tickets sold and the number of discounted tickets sold, resulting in . The student needs to focus on estimating the

31	Option A is correct	To determine the first four terms of the sequence – , where $f(1) = 27$, the student could have substituted $n = 2$, $n = 3$, and $n = 4$ into the function to determine the second, third, and fourth terms of the sequence, respectively. Since $f(1) = 27$, the student should have concluded that the first term of the sequence is 27. Substituting $n = 2$ into the function, the student could have obtained – – – so the second term of the sequence is 9. Substituting $n = 3$ into the function, the student could have obtained – – – so the third term of the sequence is 3. Last, substituting $n = 4$ into the function, the student could have obtained – – – so the fourth term of the sequence is 1. The first four terms of the sequence are 27, 9, 3, 1. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option B is incorrect	The student likely multiplied by 3 instead of multiplying by – when evaluating the function for $n = 2$, $n = 3$, and $n = 4$, resulting in the terms 27, 81, 243, 729. The student needs to focus on understanding how to identify terms of a geometric sequence when the sequence is given in function form using a recursive process.
	Option C is incorrect	The student likely identified – as the first term of the sequence and then added 27 to the numerator (top number in a fraction) for each additional term, resulting in the terms –, —, — —
		–

34	Option D is correct	To determine the linear function that models the total cost, *t*, for a single order of *c* cartridges, the student could have used the slope-intercept form of a linear eq(f71 663.4<m[(,)11 (fo)-6 (r)12 (aETQthe)-

35	4, 4	To determine the correct value of the exponent for each term, the student could

36	Option C is correct	To determine the function that models the number of students participating in sports after x years, the student could have used an exponential function of the form $f(x) = ab^x$, where a is the initial value (starting value), b

		and $x + 3y = -27$ for line *b*. The student needs to focus on understanding how to write a linear function in standard form when given a table.
	Option C is incorrect	The student likely identified the *y*-intercepts but identified the slopes as positive instead of negative before converting the equations into standard form, resulting in $y = 6x + 15$ for line *a* and $y = 3x - 9$ for line *b*. The student likely then converted the equations from slope-intercept form to standard form by subtracting the *y*-term and the constant value from both sides of the equation, obtaining $6x - y = -15$ for line *a* and $3x - y = 9$ for line *b*. The student needs to focus on understanding how to write a linear function in standard form when given a table.

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41	Option A is correct	To determine the solutions to $k(x) = 0$, the student could have used the quadratic formula (

47	Option B is correct	To determine the value of $g(20)$, the student should have substituted 20 for x in the function (relationship where each input value has a single output value) and then simplified the function, resulting in $g(20) = 6(2(20) + 7) = 6(40 + 7) = 6(47) = 282$.
	Option A is incorrect	The student likely added 6 to $2x$ before evaluating the function, obtaining $8x + 7$. The student then likely substituted $x = 20$ into the function, resulting in $g(20) = 8(20) + 7 = 160 + 7 = 167$. The student needs to focus on understanding how to apply the order of operations when simplifying a numeric expression.
	Option C is incorrect	The student likely added 20 and 7 before multiplying 20 by 2, resulting in $6(2(20 + 7)) = 6(2(27)) = 6(54) = 324$. The student needs to focus on understanding how to apply the order of operations when simplifying a numeric expression.
	Option D is incorrect	The student likely distributed (multiplied) the factor 6 to $2x$ but not to 7, obtaining $12x + 7$. The student then likely substituted $x = 20$ into the function, resulting in $g(20) = 12(20) + 7 = 240 + 7 = 247$. The student needs to focus on understanding how to apply the order of operations when simplifying a numeric expression.

48	Option C is correct	To determine the x-intercept (value where a graph crosses the x-axis) and y-intercept (value where a graph crosses the y-axis) of the line, the student could have determined that the graph of the linear function intersects (crosses) the x-axis when x = ς2, so the x-intercept is (ς2, 0). Next, the student could have determined that the graph of the linear function intersects the y-axis when $y = 8$, so the y-intercept is (0, 8). This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely switched the intercepts. The student needs to focus on understanding how to identify the intercepts of a linear function when given a graph.
	Option B is incorrect	The student likely chose the correct value for the x-intercept but used the slope (steepness of a straight line when graphed on a coordinate grid, represented by ——) of the line as the y-intercept. The student needs to focus on understanding how to identify the intercepts of a linear function when given a graph.
	Option D is incorrect	The student likely chose the correct value for the y-intercept but used the slope of the line as the x-intercept. The student needs to focus on understanding how to identify the intercepts of a linear function when given a graph.
