NAME:_____

A2.S.7: Determine the function for the regression model, using appropriate technology, and use the regression function to interpolate and extrapolate from the data

1. 060209b, P.I. A2.S.7
What is the equation of a parabola that goes through points (0,1), (-1,6), and (2,3)?

[A] $y = 2x^2 + 1$ [B] $y = 2x^2 - 3x + 1$

[C] $y = x^2 + 1$ [D] $y = x^2 - 3x + 1$

2. 010730b, P.I. A2.S.7
The accompanying table shows the number of new cases reported by the Nassau and Suffolk County Police Crime Stoppers program for the years 2000 through 2002.

Year (x)	New Cases (y)
2000	457
2001	369
2002	353

If $x = 1$ represents the year 2000, and y represents the number of new cases, find the equation of best fit using a power regression, rounding all values to the *nearest thousandth*. Using this equation, find the estimated number of new cases, to the *nearest whole number*, for the year 2007.

3. 010831b, P.I. A2.S.7

Water is draining from a tank maintained by the Yorkville Fire Department. Students measured the depth of the water in 15-second intervals and recorded the results in the accompanying table.

Time (x) (in seconds)	Depth of Water (y) (in feet)
15	11.8
30	9.9
45	8.2
60	6.3
75	5.9

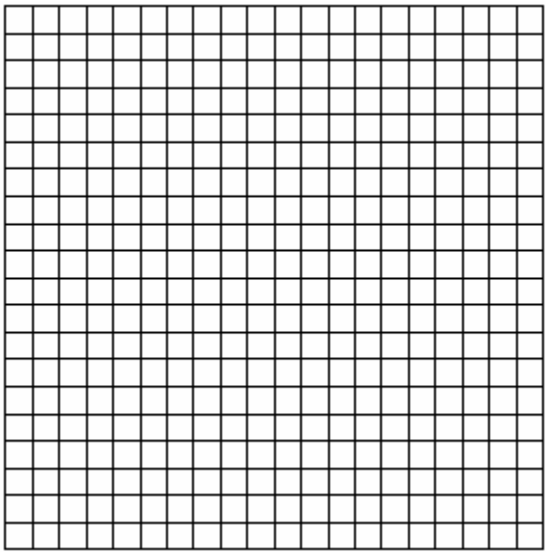
Write the power regression equation for this set of data, rounding all values to the *nearest ten thousandth.* Using this equation, predict the depth of the water at 2 minutes, to the *nearest tenth of a foot.*

4. fall9934b, P.I. A2.S.7

The volume of a particular gas was determined at various pressures. P is the pressure (in atmospheres) and is the independent variable on the horizontal axis, and V is the volume (in liters) and is the dependent variable on the vertical axis: Create a scatter plot and find the equation of the curve of best fit. (Round answer constants to *nearest tenth*) and then, using the regression equation found, estimate V if $P = 2.5$.

(4.)

P	V
0.1	225
0.3	74.999
0.5	45
0.7	32.139
0.9	25
1.1	20.45
1.5	15
1.7	13.24
1.9	11.84
2.1	10.71
2.3	9.78



A2.S.7: Determine the function for the regression model, using appropriate technology, and use the regression function to interpolate and extrapolate from the data

[1] B

[4] $y = 451.431x^{-0.243}$ and 272, and appropriate work is shown.
[3] Appropriate work is shown, but one computational or rounding error is made.
or [3] $y = 451.431x^{-0.243}$, but 7, instead of 8, is substituted for x to find the number of new cases.
or [3] $y = 451.431x^{-0.243}$ and 272, but no work is shown to find the number of cases.
or [3] The expression $451.431x^{-0.243}$ is written, and appropriate work is shown to find 272, but no equation is written.
[2] Appropriate work is shown, but two or more computational or rounding errors are made.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] The correct regression equation is written, but no further correct work is shown.
or [2] An incorrect regression equation of equal difficulty is solved appropriately for the number of new cases, and appropriate work is shown.
[1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.
or [1] An incorrect regression equation of a lesser degree of difficulty is solved appropriately for the number of new cases, and appropriate work is shown.
or [1] The expression $451.431x^{-0.243}$ is written, but no further correct work is shown.
or [1] 272, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[2]

[4] $y = 42.2326x^{-0.4494}$ and 4.9, and appropriate work is shown.
[3] Appropriate work is shown, but one computational or rounding error is made.
or [3] A correct regression equation is written and 4.9, but the substitution is not shown.
or [3] The expression $42.2326x^{-0.4494}$ is written and 4.9, and the substitution is shown.
[2] Appropriate work is shown, but two or more computational or rounding errors are made.
or [2] Appropriate work is shown, but one conceptual error is made, such as not changing 2 minutes to 120 seconds.
or [2] An incorrect power regression equation is solved appropriately, and the substitution is shown.
or [2] A correct regression equation is written, but no further correct work is shown.
[1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.
or [1] An incorrect equation of a lesser degree of difficulty is solved appropriately.
or [1] 4.9, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[3]

[6] Correct scatter plot including labeled axes, equation of best fit ($V = 22.5P^{-1}$), and at $P = 2.5$, the value of V is 9.
[5] All correct but:
No or improper labels on axes.
or Incorrectly plotted points.
or Arithmetic error finding the equation or V.
[4] Incorrect type of function for equation.
or [4] No labels on axes and some incorrectly plotted points.
or [4] No functional value at 2.5 and single graphing error.
[3] Completely incorrect graph, but correct equation and functional value at 2.5.
or [3] Correctly drawn graph, but no or incorrect equation, and no or incorrect functional value at 2.5.
[2] Correct scatterplot, but no labels on axes.
or [2] Correct equation only.
[1] Correct value at 2.5, but no work shown.
or [1] Correct scatter plot but minor errors on intervals of axes.
[0] A zero response is completely incorrect, irrelevant, or incoherent; or is a correct response that was obtained by an obviously incorrect procedure.

[4]