

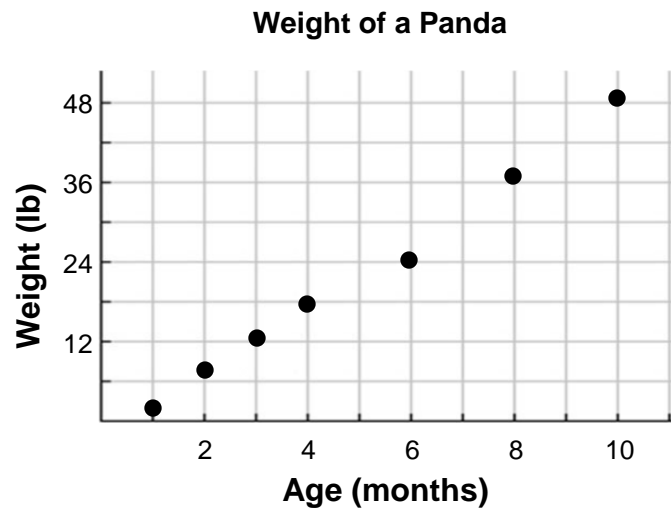
APPLICATIONS OF REGRESSIONS

Most data collected in real-world situations does not model a perfect linear, quadratic, exponential, etc relationship. Though it will not always be a perfect fit, regression in the calculator can find the line of best fit for those “messy” real-world situations.

Example 1: Remember the panda example? The table shows the relationship between the weight of a panda and its age.

Age (months)	1	2	3	4	6	8	10
Weight (lb)	2.5	7.6	12.5	17.1	24.3	37.9	49.2

- a) The data appears to follow a
Lin / Quad / Exp relationship.
- b) Use regression in the calculator to find the equation of the line of best fit.
Round values to the nearest hundredth.
- y = _____
- c) Using the equation obtained in part b, determine the approximate weight of a 7-month-old panda.



- d) Compare the answer in part c to your prediction in Topic 18-1.

Example 2: The table shows the average tuition and fees at public 4-year colleges.

- a) Turn STAT Plot1 on and Zoom 9 to determine what type of function the data most closely models.

Lin / Quad / Exp

- b) Use regression in the calculator to find the equation of the line of best fit.
Round values to the nearest hundredth.

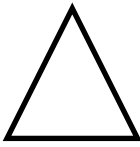
y = _____

Academic Year	Cost (\$)
2000-2001	3508
2001-2002	3766
2002-2003	4098
2003-2004	4645
2004-2005	5126
2005-2006	5492
2006-2007	5836

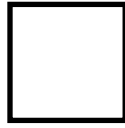
- c) Use the line of best fit to estimate the cost of attending in the 2012-2013 academic year.

Previously we learned that regression can be used to find the equation/function for patterns and sequences. Not all patterns and sequences are linear...

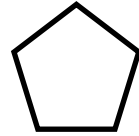
Example 3: The regular polygons below form a pattern.



Perimeter = 6 in



Perimeter = 12 in

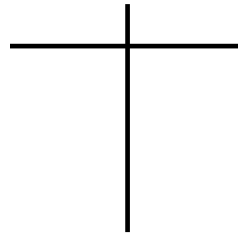


Perimeter = 20 in

- a) Write an expression that can be used to determine the perimeter of the n th figure.

Lin / Quad / Exp Expression: _____

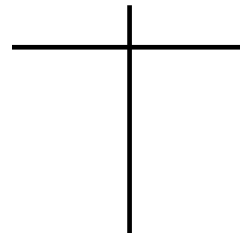
- b) What is the perimeter of the 7th figure?



- c) Write an expression that can be used to determine the perimeter of a figure with n sides.

Lin / Quad / Exp Expression: _____

- d) What is the perimeter of a figure with 7 sides?



Example 4: Mrs. Anderson's students occasionally play "Math Poker." Each student starts with \$100 (play money, of course). Each round, students "bet" money based on how confident they are that they can get the next math problem correct. When students get a question correct, they can add the amount of their bets to their totals. Bryson, a very confident student, decides to "go all in" each round. The table shows his earnings after three rounds.

- a) If Bryson continues to get questions correct, complete the table for Rounds 4 and 5.
- b) Write an equation that can be used to determine his earnings, E , after r rounds.

Lin / Quad / Exp $E =$ _____

Round, r	Earnings, E
0	100
1	200
2	400
3	800
4	
5	

- c) If Bryson gets every question correct, how much money will he have after 15 rounds?