Salt Lake Community College

Math Department

Exotic Animals Project

Name(s): Amanda Randall score: 30/30

Write down necessary steps and answers clearly to earn full credit. You may complete this project by yourself or in a group of no more than 3 people.

The following question is modified from Carl Stitz and Jeff Zeager's *Precalculus*.

Daniel's Exotic Animal Rescue houses snakes, tarantulas and scorpions. When asked how many animals of each kind he boards, Daniel answered: 'We board 25 total animals, and I am responsible for each of their 144 legs and 19 tails.' (Recall: tarantulas have 8 legs and no tail, scorpions have 8 legs and one tail, and snakes have no legs and one tail.)

Your goal is to find the number of each animal the Rescue boards by answering the following questions.

1. Use a variable to represent the number of each of the 3 animals. Write down what each variable represents.

   t=tarantula c=scorpions s=snakes

2. Write down the system of 3 linear equations.

   8t+c+s=19 8t+8c+1s=144
   t+c+s=25

3. Use substitution and/or elimination to solve the system.

   s=7 t=6 c=12

4. Solve the same system using matrices.

   Work on seperate paper

5. Check your answers.

6. State your answers in a complete sentence.

   In total there are 6 tarantulas, 12 scorpions and 7 snakes.

7. Individual Reflection: (Each student has to submit his/her own reflection.)

   Mathematics students often wonder when they will use problem-solving techniques they learn in real life. Application problems in textbooks are often created artificially so that students can apply a particular concept they learn from the section. Do you consider learning the problem solving techniques and the critical thinking skills in mathematics useful or useless? Do you consider knowing mathematics improves or worsens your life? Write at least 200 words to explain your position.

Amanda Randall

Amanda
Randall

-8 -8 -8 -200

3. $t + c + s = 25$ (-8) ①
$c + c + s = 19$ ②
$8t + 8c + c = 144$ ③

$c + 1c - 8s = -56$ $s = 7$
$-7 \quad -7$

7 snakes

$c + 7 = 19$
$-7 \quad -7$
$c = 12$ 12 scorpions

$t + 12 + 7 = 25$
-19
$t = 6$ 6 tarantulas

check

$6 + 12 + 7 = 25$ ✓
$7 + 12 = 19$ ✓

$8(6) + 8(12) = 144$
$48 + 96 = 144$ ✓

4.
$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & 25 \\ 0 & 1 & 1 & 19 \\ 8 & 8 & 0 & 144 \end{array}\right] (-1)$$

Check

$6+12+7=25$ ✓
$0+12+7=19$ ✓
$8(6)+8(12)+0=144$ ✓

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & 25 \\ 0 & -1 & -1 & -19 \\ 8 & 8 & 0 & 144 \end{array}\right] (-8)$$

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & 25 \\ 0 & -1 & -1 & -19 \\ 0 & 0 & -8 & -56 \end{array}\right] -8r_1+r_3$$

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & 6 \\ 0 & -1 & -1 & -19 \\ 0 & 1 & -8 & -56 \end{array}\right] r_1+r_2$$

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & 6 \\ 0 & -1 & -1 & -19 \\ 0 & 0 & 1 & 7 \end{array}\right] r_3 \div -8$$

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & 6 \\ 0 & -1 & 0 & -12 \\ 0 & 0 & 1 & 7 \end{array}\right] r_2+r_3$$

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & 6 \\ 0 & 1 & 0 & 12 \\ 0 & 0 & 1 & 7 \end{array}\right] (-1)$$

6 tarantulas, 12 scorpions, 7 snakes

Reflection

I think that both problem solving and critical thinking skill can both be useful and useless. Everybody needs to know the basics of problem solving for whatever you may need it in your life. But I think that the critical thinking and the more complex problem solving you need depending on your job and career. I do not get why people have to learn matrices, the quadratic formula, and thing like that if they are not going into a job that you use it. But yes, people need to know the simple add, subtract, multiplication, division and things like that because you use those things daily a lot like at the grocery store, driving, etc. Everybody needs some math skills to use, but everybody does not need the complexity of math unless you use it in your career.

As a conclusion, the simple problem solving and critical thinking things are useful for daily tasks. But the more complex problem solving and critical thinking skills are useless for your life unless you use them for your job. I think as a whole mathematics improves more than worsens your life because the simple things are good to know for your daily activities.

200 Words

?

OK.

~~Too short!~~

Sorry!