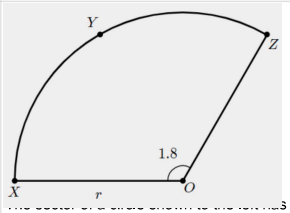
Question Topic/Area/Skill	Subscore category	Question	Gist of the question	Correct answer	Chosen answer	Why I missed it
Linear function word problems	Heart of algebra	As Marta built a square fence around her garden, she wondered how much she would have to pay if she increased the length of each side of the fence by the same number of meters. Each meter of fence costs 3 dollars. Which of the following functions best describes the additional amount of money Marta will have to spend, in dollars, if she increases each side of the fence by m meters?	figure out a linear equation formula from given scenario and understand what the variables and equation mean	f(m) = 12m	f(m) = 3m	The function I chose gives the cost of increasing one side of the fence by m meters. The question asks for the cost of increasing ALL the sides of the fence. This is multiplying 3 with 4 sides and getting 12 m.
Percents	Problem Solve and Data Analysis	Deniz had a full gallon of milk. She poured out 4 cups of milk. There are 16 cups in 1 gallon. About what percent of the original volume is left?	Use fractions to convert into percents	75%	25%	I rushed and misread the question. I chose the percent of the volume that was poured out. The questions asks the percent remaining.
Complex Numbers	N/A	$11\,i^{11}$ Which of the following is equivalent to the complex number shown above? Note: i = sqrt(-1)	Solve/simplify imaginary numbers	-11i	-11	I did not know how to solve this problem. I did not realize that i^11 would simplify to (-1)^5*i, which would be -i.
Circle Theorums	N/A	 its center at point O. The arc XYZ has length 10.8, and the central angle XOZ has measure 1.8 radians. What is the radius length, r, of the sector?	Use the formula for length of circular arc (s = rθ) to solve for r.	6	did not know	I need to remember the formulas for arc lengths, sectors, and circles as I did not remember it.
Radicals and rational exponents	N/A	$\sqrt{4p^7q^2 + p^4q^2}$ Which of the following expressions is equivalent to the expression above, assuming p and q are positive?	Simplifying and factoring radicals	$p^2q\sqrt{4p^3+1}$	$2p^{\frac{7}{2}}q + p^2q$	I applied the wrong identities to the radical expression and simplified wrong. The proper way would be to group the terms and then simplify each one.
Structure in expressions	Passport to Advanced Math	$\frac{xy}{a} - \frac{1}{b}$ Which of the following is equivalent to the above expression?	combining fractions and simplifying fractions. this problem also includes multiplying the numerator and denomination of a fraction by the same variables to combine them.	$\frac{bxy - a}{ab}$	$\frac{axy - b}{ab}$	I did not know what to do to solve this problem, so I guessed as to which expression would simplify to be the most similar to the original one.
Right triangle word problems	N/A	A ladder is leaning against a wall. The top of the ladder is 9 feet above the ground. If the bottom of the ladder is moved 3 ft farther from the wall, the ladder will be lying flat on the ground, still touching the wall. How long, in feet, is the ladder?	Use the phythagorean theorum and expressions to plug in expressions into the phythagorean theorum and solve for the missing variable	15 ft	36 ft	I guessed at this answer because I was scared of not knowing how to solve this problem. I should have used the given variables and wrote everything out so I see what to plug in and solve for.
Volume word problems	N/A	A flower box in the shape of a right rectangular prism is made of thin metal, shown above. The box has length 90 centimeters, width 45 cm, and height 45 cm. The box is 85 percent filled with soil. Each bag of soil holds 1 cubic foot, and 1 ft^3 is approximately 28,316 cubic centimeters. How many bags of soil are needed to finish filling the flower box?	Use volume formula and percent to calculate volume	1 bag	6 bags	I chose the number of bags needed to fill 85% of the flower box. The question asks for the number of bags needed to fill the REMAINING volume of the flower box. This mistake is a result of not reading the questions properly and solving for something different.
Manipulating quadratic and exponential expressions	N/A	$T = \frac{(d-15)^2}{300} + 20$ The average temperature around the Tropic of Cancer for a particular day in January can be modeled using the equation above, where T is the temperature in degrees Celsius and d is the number of days after January 1 (on January 1, d=1). According to this model, what is the lowest average temperature, in degrees Celsius, for a day in January, which has 31 days?	Understand the parts of a quadratic equation and figure out what the numbers correspond to	20	20.75	I wrote the temperature on January 1, which is not the lowest temperature throughout January. We want to find the lowest value of temperature, which occurs at the vertex. The expression for temperature is already in vertex form. The vertex of this quadratic function occurs at (15, 20). Therefore, the lowest value for temperature is 20. I did not understand how to manipulate the quadratic equation.
Solving quadratic equations	N/A	$2(x+4)^2 = 6$ inct solutions to the equation shown above. What is the exact value of a * b?	Solve for the two values of x and then multiply them. However, there is a trick where you have to go one step further than you think.	13	7	I went halfway into the question then solved the "answer" from there. However, I needed to go one step further and solve for x instead of (x+4).
Manipulating quadratic and exponential expressions	N/A	If $y = -\frac{1}{2}x^2 - 9$ is graphed in the xy-plane, which of the following characteristics of the graph are displayed as a constant or coefficient in the equation? I. xx-intercept(s) II. y-intercept III. y-coordinate of the vertex	Understand the different forms of quadratic equations and understand what each part of the equations correspond to.	II and III only	II only	I did not understand what the parts of the vertex form of a quadratic equation meant, and I only chose the answer related to the standard form of the equation.
Solving systems of linear equations	N/A	$1.5a - 4.5b = 3(a+b)$ $5.5b = 5(b-a) + 2.5a$ Consider the system of equations above. If (a,b) is the solution to the system, then what is the value of b-a?	solve a system of equations by substitution and plugging back in	0	5 (guess)	I did not have enough time to think about solving this question and did not attempt it. The proper method would be to find an expression for a in terms of b, using the first equation. We can substitute this expression for a into the second equation, and then solve for b. After this we get the answer

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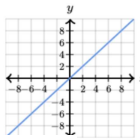
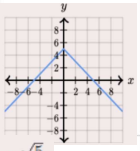
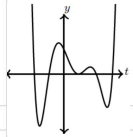
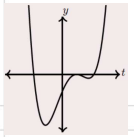
Systems of linear inequalities word problems	Heart of algebra	A rancher wants to build a rectangular pen for her animals. She decides that the length, l, of one side of the pen should be at most 60 feet, the width, w, of one side of the pen should be at least 30 feet, and the perimeter of the pen should be at most 200 feet. Which of the following systems of inequalities best models the situation described above?	Use inequalities to describe parameters	$\begin{cases} l+w \leq 100 \\ w \geq 30 \\ l \leq 60 \end{cases}$	$\begin{cases} l+w \leq 200 \\ w \geq 30 \\ l \leq 60 \end{cases}$	I did not check my answer and forgot that the perimeter of a rectangle is equal to 2l+2w. Since I did not think about this, I chose the wrong answer
Linear equation word problems	Heart of algebra	A company has determined that its maximum profit occurs when it sells 10,000 units per month. For every 1,000 units more or less than 10,000 units that the company sells, its profit decreases by $5,000. Which of the following equations can be used to find the number of units, q, in thousands, for which the profit decreases $35,000 from the maximum?	Use a word problem situation to model an inequality	$5\|q-10\| = 35$	$35\|q-10\| = 5$	The wording was very confusing to me and I did not understand how to model the inequality with the scenario. For every 1 thousand units more or less than 10 thousand that the company sells, its profit decreases by 5 thousand dollars. Therefore the unit difference should be multiplied by 5 to get the dollar difference (in thousands).
Radical and rational equations	N/A	$\sqrt{3p+13} = p+3$ he above equation?	Solve the quadratic equations and remove extraneous solutions	1	3	I solved the equation the proper way, but I did not solve for extraneous solutions once I got my answers. This led me to get the wrong answer.
Interpreting nonlinear expressions	Passport to Advanced Math	Reem is a test driver for an automobile company. The following formula gives the total distance, d, in feet that Reem drove a luxury car in the first t seconds after idling at a speed of 0 miles per hour, up to the time when she passed a particular safety cone. $d = 15.69t^2$ Compared to the time it took Reem to pass the safety cone, how long did it take to pass a sensor that was 4/9 of the distance from the start?	Solve for a number by manipulating and interpreting equations	2/3 of the time it required to pass the cone	4/9 of the time is required to pass the cone	I did not know what to do to advance in this problem. I was stuck and guessed. The proper way would be to multiply both sides by 4/9 and then rewrite it as a fraction squared. This would equal: $\frac{4}{9}d = 15.69\left(\frac{2}{3}\right)^2 t^2$ Commutative property $\frac{4}{9}d = 15.69\left(\frac{2}{3}t\right)^2$ Power of product property
Graphing linear equations	Heart of algebra	If k is a rational constant not equal to 1, which of the following graphs represents the equation $y+5 = k(x+y)+5$?	manipulate the equation to figure out the y intercept and how the graph will look like			I tried to simplify this equation but I was stuck at one point and did not know what to do. I guessed because I was confused. The proper way would be to write it in y=mx+b form. Then I could see that the graph had no y intercept and passed through the origin.
Radicals and rational exponents	N/A	$\sqrt{x} \cdot \sqrt{\frac{y^5}{x^3}}$	simplify a radical and manipulate it to get an answer	$x^{-1}y^{\frac{5}{2}}$	$\frac{y\sqrt{5}}{x\sqrt{2}}$	In this question, I forgot that you can rewrite a radical as a fractional exponent. If I had done that, I would understand that you can make the exponents fractions.
Interpreting linear functions	N/A	$d = 1.06(212-t)$ A spacecraft heading for Pluto will take pictures of several other planets on its way. The above equation gives the distance, d, in millions of kilometers, of the craft from its first photo opportunity with Mars in terms of the time, t, in days. What is the meaning of the 212 in this equation?	Figure out what one part of the equation means	It will take the spacecraft 212 days to reach the Mars photo opportunity.	The spacecraft begins its journey 212 kilometers from the Mars photo opportunity.	I did not understand what the number represented. I should have plugged in a value and figured out what it means. We see that when t = 212, this expression equals zero, which means that d also equals zero. Since d is the distance of the spacecraft from its Mars photo, we know that after 212 days, this distance is zero.
Linear function word problems	Heart of algebra	Javier has a cell phone plan that allows him to use up to 4 GB of data per month. Streaming videos is the only action he does on his phone which uses up this data. Each time he streams a video, the amount of gigabytes of his phone's data plan decreases. Specifically, his cell phone company estimates that approximately 0.12 GB of data are used for every 30 minutes of video streaming. If Javier has spent m minutes this month streaming videos, which of the following best approximates the amount of data, d, he has remaining on his plan?	Represent the scenario in an equation	$d = 4 - 0.004m$	$d = 4 - 0.12m$	I did not pay attention that every 30 minutes, 0.12 GB will be used. If I had been careful, I would know to divide by 30 to get the right amount.
Data inferences	N/A	An archaeologist uses an accelerator mass spectrometer to find the age of a buried branch. At the 68% confidence level, the spectrometer reports that the branch was 10,000 years old with a margin of error of 200 years. Which of the following could the spectrometer report as the age of the branch at the 95% confidence level?	try to estimate the margin of error and value based on a change in confidence level	10,000 years old, with a margin of error of 500 years	10,000 years old, with a margin of error of 50 years	If the archaeologist wants to be more confident, there must be a wider range of potential ages. However, the range will still center around the same age, 10,000 years old. I missed this question because I did not know how confidence level will affect the data.
Solving systems of linear equations	N/A	Consider the system of equations above, where k is a constant. For which value of k are there infinitely many (w, z) solutions?	Figure out if the equations are parallell and therefore have no solutions.	None of the above (above are numerical answers)	5 (guess)	I tried to figure out which value would make the two equations equal, but could not. I did not consider that there may be no solutions. Because their slopes do not depend on k and are not equal, these lines cannot be the same. Therefore, no value for k gives infinitely many solutions.
Polynomial factors and graphs	Passport to Advanced Math	The function p is a polynomial of t such that (t-10), (22-t), (t+10), and (20+t) are factors of p(t). Which of the following could be the graph of y=p(t) in the ty-plane?	Look at the zeroes and figure out how many zeroes are on either side of the y axis			From the four factors of p(t), we see that the graph of y=p(t) must have at least two positive t-intercepts and at least two negative t-intercepts. Only the first answer choice has at least two negative t-intercepts. All of the other choices have one or less t-intercepts.