Chapter 8 and 4 Test: Find the Error(s)

Check your Canvas email. You have been assigned five problems to do. **DO NOT COMPLETE ALL PROBLEMS IN THIS TEST**. Only complete the problems that were assigned to you.

For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

Hint: If you solve each problem yourself before looking at the student's work, then compare your work to the student's work, it will be easier to find any error(s) made by the student.

1. Find the error(s), if any:

Problem:

Solve the equation. Express your final answer in set notation as an integer or a simplified fraction. Use commas to separate answers as needed.

$(x - 2)(x + 3) = 6$

Student's Solution:

$x - 2 = 6$ or $x + 3 = 6$

$x = -6 + 2$ or $x = 6 - 3$

$x = -4$ or $x = 3$

The final answer is $\{-4, 3\}$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

2. Find the error(s), if any:

Problem:

> Solve the equation using factoring and the zero-product property. Express your final answer in set notation as an integer or a simplified fraction. Use commas to separate answers as needed.
>
> $12x^2 + 5x - 2 = 0$

Student's Solution:

$(4x + 1)(3x - 2) = 0$

$4x + 1 = 0 \quad 3x - 2 = 0$

$4x = 1 \qquad 3x = -2$

$x = \dfrac{1}{4} \qquad x = -\dfrac{2}{3}$

The final answer is $\left\{ \dfrac{1}{4}, -\dfrac{2}{3} \right\}$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

3. Find the error(s), if any:

Problem:

Use the square root property to solve the equation. The equation has real number solutions. Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.

$(2x + 7)^2 = 27$

Student's Solution:

$2x + 7 = \pm\sqrt{27}$

$2x + 7 = \pm\sqrt{3 \cdot 3 \cdot 3}$

$2x + 7 = 3 \pm \sqrt{3}$

$2x = -4 \pm \sqrt{3}$

$x = \dfrac{-4 \pm \sqrt{3}}{2}$

$x = \dfrac{-4 - \sqrt{3}}{2}, x = \dfrac{-4 + \sqrt{3}}{2}$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

4. Find the error(s), if any:

Problem:

Use the square root property to solve the equation. Simplify your answer, including any radicals and i as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.

$(z + 5)^2 = 11$

Student's Solution:

$z + 5 = \pm\sqrt{11}$

$z = -5 \pm \sqrt{11}$

$z = -5 - \sqrt{11}, z = -5 + \sqrt{11}$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

5. Find the error(s), if any:

Problem:

> Solve the equation by completing the square. The equation has real number solutions. Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.
>
> $x^2 + 6x - 1 = 0$

Student's Solution:

$a = 1, b = 6, c = -1$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{-6 \pm \sqrt{6^2 - 4(1)(-1)}}{2(1)}$

$x = \frac{-6 \pm \sqrt{40}}{2}$

$x = \frac{-6 \pm \sqrt{2 \cdot 2 \cdot 2 \cdot 5}}{2}$

$x = \frac{-6 \pm 2\sqrt{10}}{2}$

$x = \frac{-3 \pm 1\sqrt{10}}{1}$

$x = -3 \pm \sqrt{10}$

$x = -3 - \sqrt{10}, x = -3 + \sqrt{10}$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

6. Find the error(s), if any:

Problem:

Solve the equation by completing the square. Simplify your answer, including any radicals and i as needed. Rationalize any denominators. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.

$5x^2 + 10x + 4 = 0$

Student's Solution:

$\dfrac{5x^2 + 10x + 4}{5} = \dfrac{0}{5}$

$x^2 + 2x + \dfrac{4}{5} = 0$

$x^2 + 2x + \underline{\quad} = -\dfrac{4}{5} + \underline{\quad}$

$x^2 + 2x + 1 = -\dfrac{4}{5} + 1$

$(x + 1)^2 = \dfrac{1}{5}$

$x + 1 = \pm\sqrt{\dfrac{1}{5}}$

$x = -1 \pm \dfrac{\sqrt{1}}{\sqrt{5}}$

$x = -1 \pm \dfrac{1}{\sqrt{5}}$

$x = -1 \pm \dfrac{1 \cdot \sqrt{5}}{\sqrt{5} \cdot \sqrt{5}}$

$x = -1 \pm \dfrac{\sqrt{5}}{5}$

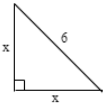$x = -1 - \dfrac{\sqrt{5}}{5}, \ x = -1 + \dfrac{\sqrt{5}}{5}$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

7. Find the error(s), if any:

Problem:

> An isosceles right triangle has legs of equal length. If the hypotenuse is 6 centimeters long, find the length of each leg. Simplify your answer. Type an exact answer, using radicals as needed. Rationalize any denominators.
>
>

Student's Solution:

$$a^2 + b^2 = c^2$$

$$x^2 + x^2 = 6^2$$

$$2x^2 = 36$$

$$x^2 = 18$$

$$x = \pm\sqrt{2 \cdot \boxed{3 \cdot 3}}$$

$$\boxed{x = 3 \pm \sqrt{2}}$$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

8. Find the error(s), if any:

Problem:

Use the quadratic formula to solve the equation. Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.

$3m^2 - 5m = 7$

Student's Solution:

$3m^2 - 5m - 7 = 0$

$a = 3, b = -5, c = -7$

$m = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$m = \frac{-(-5) \pm \sqrt{-5^2 - 4(3)(-7)}}{2(3)}$

$m = \frac{5 \pm \sqrt{-25 + 84}}{6}$

$m = \frac{5 \pm \sqrt{59}}{6}$

$m = \frac{5 - \sqrt{59}}{6}, \quad m = \frac{5 + \sqrt{59}}{6}$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

9. Find the error(s), if any:

Problem:

Use the quadratic formula to solve the equation. Simplify your answer. Provide an exact answer, using radicals and i as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed. You do **not** have to put complex numbers in $a + bi$ form.

$-4 = 2x^2 - x$

Student's Solution:

$0 = 2x^2 - x + 4$

$a = 2, b = -1, c = 4$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \dfrac{-(-1) \pm \sqrt{(-1)^2 - 4(2)(4)}}{2(2)}$

$x = \dfrac{1 \pm \sqrt{1 - 32}}{4}$

$x = \dfrac{1 \pm \sqrt{-31}}{4}$

$x = \dfrac{1 \pm i\sqrt{31}}{4}$

$x = \dfrac{1 - i\sqrt{31}}{4}, \quad x = \dfrac{1 + i\sqrt{31}}{4}$

For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

10. Find the error(s), if any:

Problem:

Use the discriminant to determine the number and types of solutions of the quadratic equation.

$-5x = -2x^2 + 3$

Student's Solution:

$a = -5, b = -2, c = 3$

Therefore, $b^2 - 4ac$ equals...

$(-2)^2 - 4(-5)(3)$

$4 + 60$

64 (positive)

The equation has two real solutions.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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11. Find the error(s), if any:

Problem:

A ball is thrown downward from the top of a 200-foot building with an initial velocity of 24 feet per second. The height of the ball h in feet after t seconds is given by the equation $h = -16t^2 - 24t + 200$. How long after the ball is thrown will it strike the ground? Simplify your answers. Type an integer or decimal rounded to the nearest hundredth as needed.
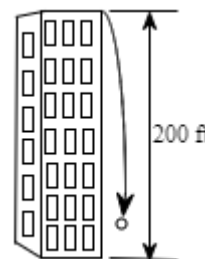
Student's Solution:

$h = -16t^2 - 24t + 200$

$a = -16, b = -24, c = 200$

Vertex is $-\dfrac{b}{2a} = -\dfrac{-24}{2(-16)} = \dfrac{-24}{-32} = 0.75$

The ball will take $\boxed{0.75 \text{ seconds}}$ to strike the ground.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

12. Find the error(s), if any:

Problem:

Sketch the graph of the quadratic function and the axis of symmetry. State the vertex and give the equation for the axis of symmetry. Type an ordered pair (point).
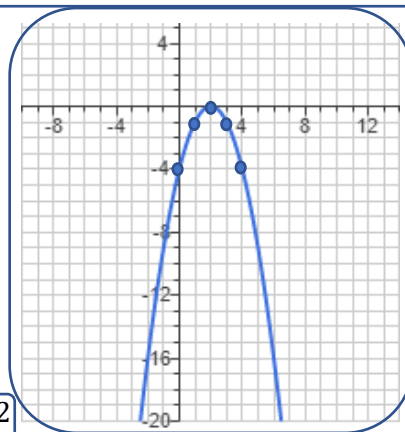
$f(x) = -(x - 2)^2$

Student's Solution:

$a = -1, h = 2, k = 0$

x	y
0	−4
1	−1
2	0
3	−1
4	−4

The vertex is (2,0)

The axis of symmetry is $y = 2$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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13. Find the error(s), if any:

Problem:

Sketch the graph of the quadratic function and the axis of symmetry. State the vertex and give the equation for the axis of symmetry. Type an ordered pair (point).
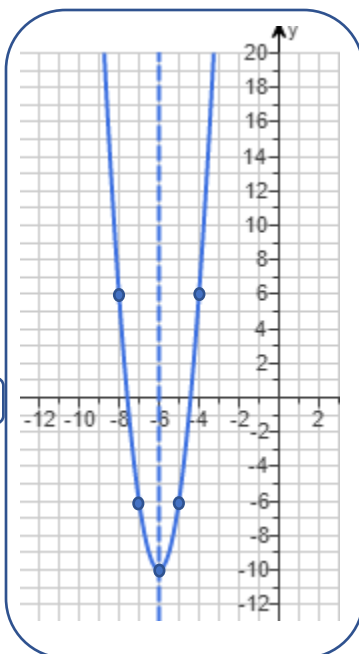
$h(x) = 4(x + 6)^2 - 10$

Student's Solution:

$a = 4, h = 6, k = -10$

The vertex is $(6, -10)$.

x	y
-8	6
-7	-6
-6	-10
-5	-6
-4	6

The axis of symmetry is $x = -6$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

14. Find the error(s), if any:

Problem:

Find the vertex of the graph of the quadratic function; express the vertex as an ordered pair (point). Determine whether the graph opens upward or downward and find any intercepts. Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.

$f(x) = x^2 + 4$

Student's Solution:

Vertex: $(0,4)$. It opens up. (I did those in my head.) As for the intercepts...

$y = x^2 + 4$

Let $y = 0$ Let $x = 0$

$0 = x^2 + 4$ $y = 0^2 + 4$

$-4 = x^2$ $y = 0 + 4$

$x = -2$ or 2 $y = 4$

x-intercepts: $(-2,0)$ and $(2,0)$ y-intercept: $(0,4)$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

15. Find the error(s), if any:

Problem:

Find the vertex of the graph of the quadratic function. Determine whether the graph opens upward or downward, find any intercepts, and sketch the graph. You do not have to sketch the axis of symmetry. Simplify your answer. Provide an ordered pair (point). Use integers or fractions for any numbers.
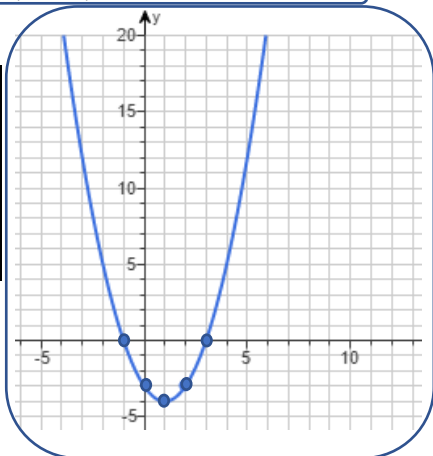
$f(x) = x^2 - 2x - 3$

Student's Solution:

$a = 1, b = -2, c = -3$ (The denominator of a is 1.)

vertex $x = -\dfrac{b}{2a} = -\dfrac{-2}{2(1)} = 1$ vertex $y = c - \dfrac{b^2}{4a} = -3 - \dfrac{(-2)^2}{4(1)} = -3 - \dfrac{4}{4} = -3 - 1 = -4$

The vertex is $(1, -4)$. The graph opens up. Sometimes the intercepts come from the table, so I'll do that first...

x	y
-1	0
0	-3
1	-4
2	-3
3	0

From the table, the x-intercepts are $(-1,0)$ and $(3,0)$. The y-intercept is $(0, -3)$.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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16. Find the error(s), if any:

Problem:

The cost C in dollars of manufacturing x bicycles at a production plant is given by the function shown below.

$$C(x) = 3x^2 - 1200x + 132500$$

a. Find the number of bicycles that must be manufactured to minimize the cost.
b. Find the minimum cost.

Student's Solution:

$a = 3, b = -1200, c = 132500$

vertex $x = -\dfrac{b}{2a} = -\dfrac{-1200}{2(3)} = 200$

vertex $y = c - \dfrac{b^2}{4a} = 132500 - \dfrac{(-1200)^2}{4(3)} = 132500 - \dfrac{1440000}{12} = 132500 - 120000 = 12500$

a. Manufacture 12500 bicycles.
b. The minimum cost is $200.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

17. Find the error(s), if any:

Problem:

Find two numbers whose difference is 36 and whose product is as small as possible. [Hint: Let x and $x - 36$ be the two numbers. Their product can be described by the function $f(x) = x(x - 36)$.]

Student's Solution:

$f(x) = x(x - 36)$

$0 = x(x - 36)$

$x = 0$ or $x - 36 = 0$

$x = 0$ $x = 36$ The two numbers are 0 and 36 and their product is 0.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

18. Find the error(s), if any:

Problem:

Determine whether the ordered pair $(5,1)$ is a solution of the system.

$$\begin{cases} 2x - 5y = 5 \\ 5x + 2y = -23 \end{cases}$$

Student's Solution:

$2(5) - 5(1) = 5$

$10 - 5 = 5$

$5 = 5$ ✓

Yes, the point $(5,1)$ is a solution of the system.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

19. Find the error(s), if any:
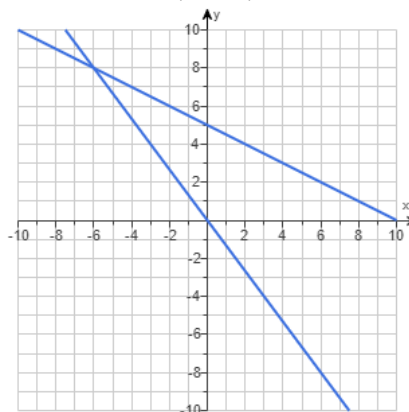
Problem:

Solve the system by graphing.
$$\begin{cases} x + 2y = 10 \\ 3y - 4x = 0 \end{cases}$$

Student's Solution:

Using the intercepts method...

If $x = 0$	If $y = 0$	If $x = 0$	If $y = 0$	Got the same point twice.
$0 + 2y = 10$	$x + 2(0) = 10$	$3y - 4(0) = 0$	$3(0) - 4x = 0$	Need a second point.
$2y = 10$	$x + 0 = 10$	$3y - 0 = 0$	$0 - 4x = 0$	Using coefficients, second
$y = 5$	$x = 10$	$3y = 0$	$-4x = 0$	point is $(3, -4)$.
$(0,5)$	$(10,0)$	$y = 0$	$x = 0$	
		$(0,0)$	$(0,0)$	

The solution is $(-6,8)$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

20. Find the error(s), if any:

Problem:

Use the substitution method to solve the following system of equations.

$$\begin{cases} \dfrac{5}{6}x - \dfrac{1}{6}y = \dfrac{1}{3} \\ \dfrac{1}{2}x + \dfrac{3}{4}y = -\dfrac{3}{2} \end{cases}$$

Student's Solution:

First equation:	Second Equation:	Substituting y from first	Substituting $x = 0$
$6\left(\dfrac{5}{6}x - \dfrac{1}{6}y\right) = 6\left(\dfrac{1}{3}\right)$	$4\left(\dfrac{1}{2}x + \dfrac{3}{4}y\right) = 4\left(-\dfrac{3}{2}\right)$	equation into second...	into $y = 5x - 2$...
$5x - y = 2$	$2x + 3y = -6$	$2x + 3(5x - 2) = -6$	$y = 5(0) - 2$
$5x - 2 = y$		$2x + 15x - 6 = -6$	$y = 0 - 2$
		$17x = 0$	$y = -2$
		$x = 0$	

A. There is one solution. The solution of the system is _____$(0,-2)$_____
   (Simplify your answer. Type an ordered pair.)

B. The solution set of the system is $\{(x,y)|$ _____ $\}$.

C. The solution set is ø.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

21. Find the error(s), if any:

Problem:

Solve the system of equations by the elimination method. Use integers or fractions for any numbers in the expression.

$$\begin{cases} 3x - 7y = 1 \\ 8x - 2y = 36 \end{cases}$$

Student's Solution:

Second equation	Put y from first equation in second	Put $x = 5$ in $y = 4x - 18$
$\frac{8x-2y}{2} = \frac{36}{2}$	$3x - 7(4x - 18) = 1$	$y = 4(5) - 18$
$4x - y = 18$	$3x - 28x + 126 = 1$	$y = 20 - 18$
$4x - 18 = y$	$-25x = -125$	$y = 2$
	$x = 5$	

A. There is one solution. The solution of the system is _____(5,2)_____
   (Simplify your answer. Type an ordered pair.)
B. The solution set of the system is {(x,y)| _____ }.
C. The solution set is ∅.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

22. Find the error(s), if any:

Problem:

Solve the system of equations.

$$\begin{cases} \frac{4}{5}x + y = \frac{23}{5} \\ -\frac{1}{8}x - \frac{1}{4}y = -\frac{11}{8} \end{cases}$$

Student's Solution:

First equation:	Second Equation:	Substituting x from second	Put $y = 7$ into
$5\left(\frac{4}{5}x + y\right) = 5\left(\frac{23}{5}\right)$	$8\left(-\frac{1}{8}x - \frac{1}{4}y\right) = 8\left(-\frac{11}{8}\right)$	equation into first	$x = 11 - 2y$
$4x + 5y = 23$	$-x - 2y = -11$	$4(11 - 2y) + 5y = 23$	$x = 11 - 2(7)$
	$11 - 2y = x$	$44 - 8y + 5y = 23$	$x = 11 - 9$
		$-3y = -21$	$x = 2$
		$y = 7$	

A. There is one solution. The solution of the system is ____(2,7)____
   (Simplify your answer. Type an ordered pair.)
B. The solution set of the system is $\{(x,y)|$ _____ $\}$.
C. The solution set is Ø.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

23. Find the error(s), if any:

Problem:

Solve the system of equations.

$$\begin{cases} x = 5y + 3 \\ 2x - 10y = 6 \end{cases}$$

Student's Solution:

Solve first equation for y Substitute y from first equation

$x - 3 = 5y$

$y = \frac{x-3}{5}$ $x = 5\left(\frac{x-3}{5}\right) + 3$

$x = x - 3 + 3$

$x = x$ (identity; lines are identical)

○ A.   There is one solution. The solution of the system is ――――――
(Simplify your answer. Type an ordered pair.)

● B.   The solution set of the system is $\{(x,y) \mid$ _x = 5y + 3_ $\}$.

○ C.   The solution set is ∅.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

24. Find the error(s), if any:

Problem:

Solve the system of equations.
$$\begin{cases} 3x - 6y = 6 \\ 6x - 12y = 36 \end{cases}$$

Student's Solution:

Use elimination. Multiply first equation by -2 on both sides.

$-2(3x - 6y) = -2(6)$

$-6x - 12y = -12$

Now the new system is...
$$\begin{cases} -6x - 12y = -12 \\ 6x - 12y = 36 \end{cases}$$

Add the equations...

$0x - 24y = 24$

$-24y = 24$

$y = -1$

Plug $y = -1$ into first equation

$3x - 6(-1) = 6$

$3x + 6 = 6$

$3x = 0$

$x = 0$

A. There is one solution. The solution of the system is _(0, −1)_
(Simplify your answer. Type an ordered pair.)

B. The solution set of the system is {(x,y)| _____ }.

C. The solution set is ∅.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

25. Find the error(s), if any:

Problem:

There are two aircraft carriers, A and B, and carrier A is longer than carrier B. The total length of these two carriers is 4178 feet, while the difference of their lengths is only 14 feet. Find the length of each carrier. Simplify your answers. Use integers or decimals.

Student's Solution:

Let A be the length of carrier A and let B be the length of carrier B. Then…

$$\begin{cases} A + B = 4718 \\ A - B = 14 \end{cases}$$

Add the equations

$2A + 0B = 4732$

$2A = 4732$

$A = 2366$

Substitute A in first equation

$2366 + B = 4718$

$B = 2352$

The length of carrier A is 2366 feet and the length of carrier B is 2352 feet.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

26. Find the error(s), if any:

Problem:

Find out how many quarts of 5% butterfat milk and 1% butterfat milk should be mixed to yield 60 quarts of 2% butterfat milk.

Student's Solution:

Let x be the number of quarts of 5% butterfat milk

and y be the number of quarts of 1% butterfat milk.

$$\begin{cases} x + y = 60 \\ 5\%(x) + 1\%(y) = 2\%(60) \end{cases}$$

Writing the second equation without %...

$0.5x + 0.1y = .2(60)$

$0.5x + 0.1y = 12$

Multiply by 10 on both sides to clear decimals

$10(0.5x + 0.1y) = 10(12)$

$5x + y = 120$

$y = 120 - 5x$

Substitute into first equation

$y = 120 - 5x$

$x + (120 - 5x) = 60$

$-4x = -180$

$x = 45$

Substitute $x = 45$ into first equation

$45 + y = 60$

$y = 15$

Mix 45 quarts of 5% butterfat milk with 15 quarts of 1% butterfat milk.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

27. Find the error(s), if any:

Problem:

A woman bought some large frames for $15 each and some small frames for $8 each at a closeout sale. If she bought 27 frames for $272, find how many of each type she bought.

Student's Solution:

$$\begin{cases} x + y = 27 \\ 15x + 8y = 272 \end{cases}$$

Solve first equation for y.

$y = 27 - x$

Substitute into second equation.

$15x + 8(27 - x) = 272$

$15x + 216 - 8x = 272$

$7x = 56$

$x = 8$

Plug $x = 8$ into first equation.

$8 + y = 27$

$y = 19$

The woman bought 8 small frames and 19 large frames.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

28. Find the error(s), if any:

Problem:

An airplane takes 3 hours to travel a distance of 2160 miles with the wind. The return trip takes 4 hours against the wind. Find the speed of the plane in still air and the speed of the wind.

Student's Solution:

Let P be the speed of the plane in still air and let W be the speed of the wind.

$d = rt$

$2160 = (P - W) \cdot 3$ (with the wind)

$2160 = (P + W) \cdot 4$ (against the wind)

Working with equation 1:

$2160 = (P - W) \cdot 3$

$\frac{2160}{3} = \frac{(P-W) \cdot 3}{3}$

$720 = P - W$

Working with equation 2:

$2160 = (P + W) \cdot 4$

$\frac{2160}{4} = \frac{(P+W) \cdot 4}{4}$

$540 = P + W$

Putting them together

$\begin{cases} P - W = 720 \\ P + W = 540 \end{cases}$

Add the equations…

$2P = 1260$

$P = 630$

Put $P = 630$ in

$540 = P + W$

to get…

$540 = 630 + W$

$W = -90$

The speed of the plane in still air is 630 mph and the speed of the wind is -90 mph.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

29. Find the error(s), if any:

Problem:

The perimeter of a triangle is 88 centimeters. If two sides are equally long and the third side is 8 centimeters longer than the others, find the lengths of the three sides. Round to the nearest tenth as needed.

Student's Solution:

Since two sides are equally long, the lengths of the sides are x, x and 8. Therefore...

$x + x + 8 = 88$

$2x + 8 = 88$

$2x = 80$

$x = 40$

The three sides are 40 centimeters, 40 centimeters and 8 centimeters.

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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For each problem number, you will see a math problem followed by a student's solution to that problem. Your task is to find the error(s) in the student's solution, if any.

30. Find the error(s), if any:

Problem:

The planning department of Abstract Office Supplies has been asked to determine whether the company should introduce a new computer desk next year. The department estimates that $12,000 of new manufacturing equipment will need to be purchased and that the cost of constructing each desk will be $100. The department also estimates that the revenue from each desk will be $400.

    a. Determine the revenue function $R(x)$ from the sale of x desks.
    b. Determine the cost function $C(x)$ for manufacturing x desks.
    c. Find the number of desks that must be sold for the company to break even.

Student's Solution:

Revenue equals quantity times price, so…

$R(x) = x \cdot 400$

$\boxed{R(x) = 400x}$

Costs equal [variable costs]· x +[fixed costs]

$C(x) = 100 \cdot x + 12000$

$\boxed{C(x) = 100x + 12000}$

To find break even point, set $C(x) = 0$

$0 = 100x + 12000$

$100x = -12000$

$x = -120$

$\boxed{\text{The company must make and sell 120 desks}}$

$\boxed{\text{to break even.}}$

Evaluate the student's solution. If the student's solution is completely correct, write "The student's solution is correct." Otherwise, describe each error in your own words. Do not correct the error. Do not write what the correct answer/solution should have been. Just describe, in your own words, what is wrong with the student's solution. Your job is to convince me that you understand algebra.

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