SECTION-12: Distributive Law Errors

Two Broken-Symmetry (BS) Math Equations that Produce Incorrect Answers.

These following two equations cannot yield correct answers using BS math.

The first equation is:

$2x - x = 0$	starting equation
$2x - x + x = +x$ $2x = x$	Add 'x' to both sides
$2(1) = 1$	let 'x' = 1
$2 = 1$	This is an incorrect answer
2(0)-(0)=0	The only answer that BS math can give is x=0

The above equation is easily solved with non-zero answers with SM.

The second equation is:

$a = b$	starting equation
$(a)(a) = (a)(b)$	multiply both sides by (a)
$(a)(a) - (b)(b) = (a)(b) - (b)(b)$	subtract $((b)(b))$ from both sides
$((a-b)(a+b)) = (a-b)(b)$	factor $(a-b)$ from both sides
$(a+b) = b$	divide both sides by $(a-b)$
$(b+b) = b$	replace (a) with (b)
$2b = b$	simplify
$2(1) = (1)$	Let $(b) = 1$
$2 = 1$	Again, BSM yields and incorrect answer.

This incorrect result is a problem with the distributive law. SM explains how this incorrect answer is obtained and the problem with the distributive law that allows the error. This problem cannot be solved with the BS math rule-of-signs.

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$\vec{2}-\overleftarrow{\#}=0$	starting equation
$\vec{2}=\vec{\#}$	Add $\vec{\#}$ to both sides
$\rightarrow=\frac{\#}{\vec{2}}$	solve for $\rightarrow$
$(2)(\frac{\vec{\#}}{2})-\overleftarrow{\#}=0$ $\vec{\#}+\overleftarrow{\#}=0$	a subtraction of $\overleftarrow{\#}$ is an addition to the right $\vec{\#}$

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$a=b$	starting equation	**a=2 , b=2**
$(a)(a)=(a)(b)$	multiply both sides by (a)	**(2)(2) = (2)(2)**
$(a)(a)-(b)(b)$ $=(a)(b)-(b)(b)$	subtract $((b)(b))$ from both sides	**(2)(2)-(2)(2)** **= (2)(2)-(2)(2)**
$((a-b)(a+b))$ $=(a-b)(b)$	factor $(a-b)$ from both sides **JK:** *This is where BS Math breaks down. BS math rules multiply a subtraction operation by an addition operator. This is illogical. The answer cancels the middle two terms. The zero terms are cancelled and incorrect and illogical math follows. If you continue on with BSM, you get incorrect answers.*	**(2-2)(2+2)** **= (2-2)(2)** **(0)(2) = (0)(2)** **This is obviously incorrect** **0=0 is not a solution. The answer is 2=2**
$(a+b)=b$	divide both sides by $(a-b)$ **JK:** *You are canceling the zeros. This happens any time the left side of the number line is multiplied by the right side of the number line (a-b)(a+b). The (a-b) is removed from the calculation.*	*This is not permitted in SM.*
$(b+b)=b$	replace (a) with (b)	
$2b=b$	simplify	
$2(1)=(1)$	Let $(b)=1$	
$2=1$	Again, BS math yields and incorrect answer of 2=1.	

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BS Math:

$$(a+b)^2 = (a+b)(a+b) = a^2 + ab + ba + b^2 = a^2 + 2ab + b^2$$

If we substitute numbers labeled 'positive' into the equations, the answers will be correct.

If a=5 and b=3 $(5+3)^2 = (5+3)(5+3) = (5)(5) + (5)(3) + (3)(5) + (3)(3) = 25 + 15 + 15 + 9 = 64$

If a=3 and b=5 $(3+5)^2 = (3+5)(3+5) = (3)(3) + (3)(5) + (5)(3) + (5)(5) = 9 + 15 + 15 + 25 = 64$

$$(a-b)^2 = (a-b)(a-b) = (a)(a) - (a)(b) - (b)(a) + (b)(b) = a^2 - 2ab + b^2$$

JK NOTE: By definition, in BS math, no number squared can ever be a term labeled 'negative'. Therefore, no squared number can ever be a vector moving in the dash (-) or negative direction. This is illogical and violates symmetry and relativity. (JK: NOTE: This is why BS math breaks down. You cannot multiply opposite direction in space. The distributive law needs modification).

If a=5 and b=3 $\boxed{(5-3)^2 = (2)^2 = \sum_2 2 = 2 + 2 = 4}$ $\boxed{\begin{aligned}(5-3)^2 &= (2)^2 = 4\\ (3-5)^2 &= (-2)^2 = 4\end{aligned}}$ **This is illogical**

$$\boxed{(5-3)^2 = (5-3)(5-3) = 5^2 - (5)(3) - (3)(5) + 3^2 = 5^2 - 2(5)(3) + 3^2 = 25 - 30 + 9 = 4}$$

as long as the subtraction process produces a number labeled 'positive', the answer is usable. The logic is still incorrect.

$$(5r - 3r)^2 = (5r + 3l)^2 = (5r + 3l)(5r + 3l) = 25r + (5r)(3l) + (3l)(5r) + 9l = ?$$

it is illogical to multiply a number on the left side of the number line times a number on the right side of the number line.

If a=3 and b=5 $\boxed{(3-5)^2 = (-2)^2 = \sum_2 -2 = (-2) + (-2) = -4}$

The answer cannot be +4. BS math is **incorrect.**

$$\boxed{(3-5)^2 = (3-5)(3-5) = 3^2 - (3)(5) - (5)(3) + 5^2 = 3^2 - 2(3)(5) + 5^2 = 9 - 30 + 25 = 4}$$

If you use incorrect BSM, you come up with an answer of +4. **This is incorrect and illogical.**

$(3-5)^2 = (3 \text{ right sub } 5 \text{ right})^2 = (3 \text{ right add } 5 \text{ left})^2 = (3r + 5l)(3r + 5l) = 9r + (3r)(5l) + (5l)(3r) + 25r$

The two middle terms of a direction to the right multiplied by a direction to the left are illogical. With SM, if you solve the equation inside the brackets and square the results, you will get a correct answer.

$$(\vec{3} - \vec{5})^2 = (\vec{3} + \overleftarrow{5})^2 = (\overleftarrow{2})^2 = \underleftarrow{4}$$

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Here is a BS math answer and the answer that Barry Mazur* calculated.

Solve this equation using the distributive law: $\left(\frac{1+\sqrt{-3}}{2}\right)^3$

Do the computation carefully, on paper, using the rules we agreed to. Then ponder your answer, which should be something of a surprise to you, (JK: definitely a surprise; incorrect and illogical) don't stop there. Think of what your answer might possibly mean or might imply.

$$\left(\frac{1+\sqrt{-3}}{2}\right)\left(\frac{1+\sqrt{-3}}{2}\right)\left(\frac{1+\sqrt{-3}}{2}\right)$$

$$\left(\frac{1}{2}+\frac{\sqrt{-3}}{2}\right)\left(\frac{1}{2}+\frac{\sqrt{-3}}{2}\right)=\frac{1}{4}+\frac{\sqrt{-3}}{4}+\frac{\sqrt{-3}}{4}+\frac{-3}{4}=-\frac{2}{4}+\frac{2\sqrt{-3}}{4}=-\frac{1}{2}+\frac{\sqrt{-3}}{2}$$

$$\left(-\frac{1}{2}+\frac{\sqrt{-3}}{2}\right)\left(\frac{1}{2}+\frac{\sqrt{-3}}{2}\right)=-\frac{1}{4}-\frac{\sqrt{-3}}{4}+\frac{\sqrt{-3}}{4}-\frac{3}{4}=-1$$

When the distributive law is used with the rule-of-signs and one of the signs is a (-) dash sign, the middle two terms always cancel each other. This leads to the incorrect answer of (-1) in the above equation.

JK: Barry Mazur did not go back and check his answer with the original equation. If he had, he would have known that the answer was incorrect:

$\left(\frac{1+\sqrt{-3}}{2}\right)^3=-1$	check answer by setting equal
$\sqrt[3]{\left(\frac{1+\sqrt{-3}}{2}\right)^3}=\sqrt[3]{-1}$ $\left(\frac{1+\sqrt{-3}}{2}\right)=-1$	Take the Cube Root of both sides
$1+\sqrt{-3}=-2$	multiply both sides by 2
$\sqrt{-3}=-3$	subtract 1 from both sides
$\left(\sqrt{-3}\right)^2=(-3)^2$	square both sides
$-3=9$	This is an incorrect answer. A simple equation check could have shown that the distributive law using BS math produces an incorrect answer.

* From "Imaging Numbers"(p148) by Barry Mazur: Gerhard Gade University Professor doing math at Harvard University.