PRACTICE

TRUE/FALSE Circle true or false. If true, circle the property used to determine the expressions equivalent.

1. $7 + 9 = 9 + 7$

TRUE or FALSE

If true, equivalent by…

Commutative Property
Associative Property
Distributive Property

2. $(8 \cdot 3)4 = 8(3 \cdot 4)$

TRUE or FALSE

If true, equivalent by…

Commutative Property
Associative Property
Distributive Property

3. $a + (9 + b) = (a + 9) + b$

TRUE or FALSE

If true, equivalent by…

Commutative Property
Associative Property
Distributive Property

4. $x - 8 = 8 - x$

TRUE or FALSE

If true, equivalent by…

Commutative Property
Associative Property
Distributive Property

5. $ac + dc = dc + ac$

TRUE or FALSE

If true, equivalent by…

Commutative Property
Associative Property
Distributive Property

6. $(a + b)^2 = a^2 + b^2$

TRUE or FALSE

If true, equivalent by…

Commutative Property
Associative Property
Distributive Property

Fill in the reasons for each proof with the correct property used.

7. Prove: $x^2(2y) = (2x^2)y$

$x^2(2y)$	Given
$(x^2 2)y$	Associative Property
$(2x^2)y$	Commutative Property

8. Prove: $3(5 - x) = -3x + 15$

$3(5 - x)$	Given
$15 - 3x$	Distributive Property
$-3x + 15$	Commutative Property

9. Prove: $t + (2 + t) = 2t + 2$

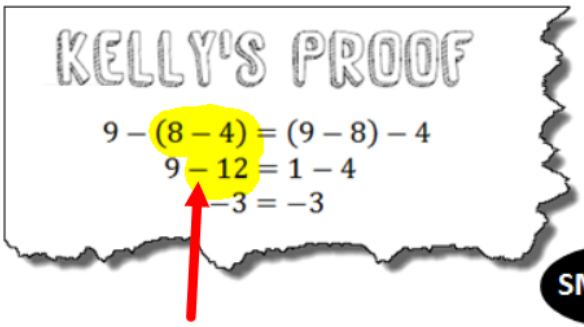
$t + (2 + t)$	Given
$t + (t + 2)$	Commutative Property
$(t + t) + 2$	Associative Property
$2t + 2$	Combine Like Terms

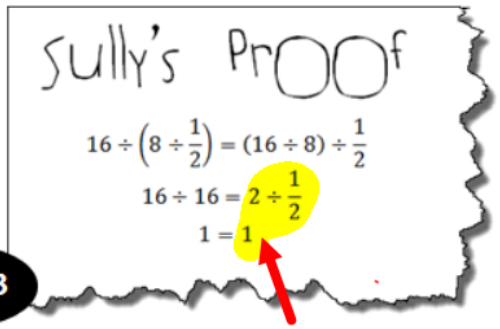
10. Prove: $2(h + 5) + 4h = 6h + 10$

$2(h + 5) + 4h$	Given
$2h + 10 + 4h$	Distributive Property
$2h + 4h + 10$	Commutative Property
$6h + 10$	Combine Like Terms

Analyze student work.

11. Mr. Kelly and Mr. Sullivan love the associative property. They refuse to believe that the associative doesn't work for subtraction and division. They both work a problem incorrectly in a weak attempt to prove that the associative property does indeed work for subtraction and division. THEY ARE BOTH WRONG! Correct their feeble attempts at a real mathematical proof by showing both sides do NOT equal each other.





SMP #3

Mr. Kelly said (8 - 4) was -12 which is wrong.

8 - 4 = 4

$9 - (8 - 4) = (9 - 8) - 4$

9 - 4 ≠ 1 - 4

5 ≠ -3

Sully said $2 \div \frac{1}{2}$ was 1 which is wrong.

$2 \div \frac{1}{2} = 4$

$16 \div \left(8 \div \frac{1}{2}\right) = (16 \div 8) \div \frac{1}{2}$

$16 \div 16 = 2 \div \frac{1}{2}$

1 ≠ 4

Simplify the expression by using the distributive property.

12. $4(x+3)$

$4x+12$

13. $5(m+5)$

$5m+25$

14. $-8(p-3)$

$-8p+24$

15. $(2r-3)(2)$

$2(2r-3)$

$4r-6$

16. $6.5(v+1)$

$6.5v+6.5$

17. $-(3+x)$

$-3-x$

18. $\frac{3}{2}(8m-4)$

$\frac{3}{2}\left(\frac{8m}{1}\right)-\frac{3}{2}\left(\frac{4}{1}\right)$

$\frac{24m}{2}-\frac{12}{2}$

$12m-6$

19. $-(6n-9)$

$-6n+9$

20. $-\frac{2}{3}(6n-9)$

$-\frac{2}{3}\left(\frac{6n}{1}\right)+\frac{2}{3}\left(\frac{9}{1}\right)$

$-\frac{12n}{3}+\frac{18}{3}$

$-4n+6$

Simplify the expression using distributive property and combine like terms.

21. $6+2(y+1)$

$6+2y+2$

$2y+6+2$

$2y+8$

22. $2(4a-1)+a$

$8a-2+a$

$8a+a-2$

$9a-2$

23. $6r-2(r+4)$

$6r-2r-8$

$4r-8$

24. $-3(m+5)-10$

$-3m-15-10$

$-3m-25$

25. $3-8(w-5)$

$3-8w+40$

$-8w+3+40$

$-8w+43$

26. $(s-3)(2)+17s$

$2(s-3)+17s$

$2s-6+17s$

$2s+17s-6$

$19s-6$

27. $\frac{1}{2}(2m+6)-10$

$\frac{1}{2}\left(\frac{2m}{1}\right)+\frac{1}{2}\left(\frac{6}{1}\right)-10$

$\frac{2m}{2}+\frac{6}{2}-10$

$m+3-10$

$m-7$

28. $3(2a+4)-5(3a+1)$

$6a+12-15a-5$

$6a-15a+12-5$

$-9a+7$

29. $5+3\left(2u+\frac{1}{3}\right)$

$5+3(2u)+\frac{3}{1}\left(\frac{1}{3}\right)$

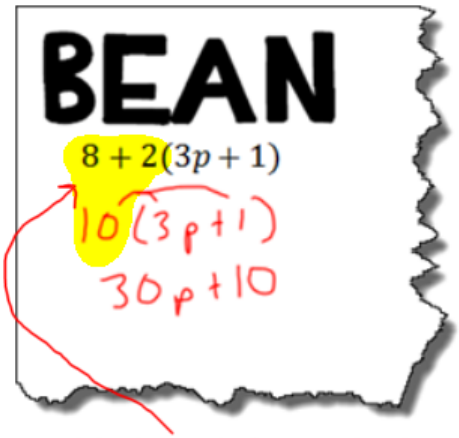
$5+6u+\frac{3}{3}$

$6u+5+1$

$6u+6$

Analyze student work.

30. Mr. Bean and Mr. Brust are really, really bad at the distributive property. They both make huge mistakes using the distributive property. Identify their mistakes and show them how to distribute correctly.



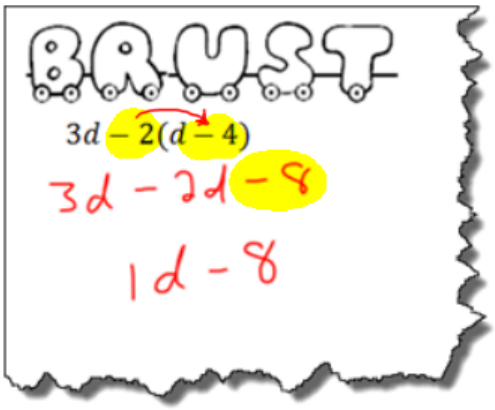
Mr. Bean added 8 + 2 first which is wrong. Order of operations says you must multiply first, you should distribute the 2.

$8+2(3p+1)$

$8+6p+2$

$6p+8+2$

$6p+10$



Mr. Brust did not distribute the negative 2 to the minus 4.

$3d-2(d-4)$

$3d-2d+8$

$d+8$