**DISTRIBUTIVE PROPERTY**

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| --- |
| *For any numbers* $a$*,*$ b$*,* *and* $c$*, the product of* $a$ *and* $\left(b+c\right)$*is:* |
| $$a\left(b+c\right)=ab+ac$$ | $$\left(b+c\right)a=ba+ca$$ |
| *For any numbers* $a$*,*$ b$*,* *and* $c$*, the product of* $a$ *and* $\left(b-c\right)$*is:* |
| $$a\left(b-c\right)=ab-ac$$ | $$\left(b-c\right)a=ba-ca$$ |

**Sample Problem 1**: Rewrite using the distributive property, then evaluate.

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| --- | --- | --- | --- | --- |
|  | $$8\left(10+4\right)$$ | $$=8⋅10+8⋅4$$ | $$=80+32$$ | $$=112$$ |
|  | $$\left(5+7\right)12$$ | $$=5⋅12+7⋅12$$ | $$=50+84$$ | $$=134$$ |
|  | $$5\left(100-72\right)$$ | $$=5⋅100-5⋅72$$ | $$=500-360$$ | $$=140$$ |
|  | $$\left(2+\frac{1}{5}\right)35$$ | $$=2⋅35+\frac{1}{5}⋅35$$ | $$=70+7$$ | $$=77$$ |
|  | $$\left(10+7\right)5$$ | $$=10⋅5+7⋅5$$ | $$=50+35$$ | $$=85$$ |

**TERM** is a number, a variable or a product or quotient of numbers and variables.

**LIKE TERMS** are terms that contain the same variables, with corresponding variables having the same power.

**SIMPLIFYING EXPRESSIONS**:

Distributive property is used to combine like terms by adding their coefficients. A simplified expression must not have grouping symbols and fractions are reduced to its lowest term.

**Sample Problem 2**: Simplify.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | $$18x+3x$$ | $$=21x$$ |  |  |
|  | $$5x^{2}+2-x^{2}$$ | $$=4x^{2}+2$$ |  |  |
|  | $$3-2\left(4+x\right)$$ | $$=3-2\left(4\right)-2\left(x\right)$$ | $$=3-8-2x$$ | $$=-5-2x$$ |
|  | $$-3\left(2x^{2}+4x-1\right)+5x$$ | $$=-3\left(2x^{2}\right)-3\left(4x\right)-3\left(-1\right)+5x$$ | $$=-6x^{2}-12x+3+5x$$ | $$=-6x^{2}-7x+3$$ |
|  | $$5\left(x-7y\right)+8\left(3x+2y\right)$$ | $$=5\left(x\right)-5\left(7y\right)+8\left(3x\right)+8\left(2y\right)$$ | $$=5x-35y+24x+16y$$ | $$=29x-19y$$ |

**Sample Problem 3**: Manny runs a restaurant. One day, a total of 50 steaks are sold. Each steak cost $14.95 and received an average tip of $1 for each. Write the expression that determines the total amount he earned. How much did Manny earned?

$$50\left(14.95+1\right)$$

$$=50\left(15.95\right)$$

$$=\$797.5$$