Rational Expressions & Equations

**Formula Sheet**

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| **Name** | **Definition** | **Formula** |
| Commutative Property | A property of algebra that states that the order in which algebraic terms are added or multiplied together does not affect the sum or product of those terms. | Addition: $$a+b=b+a $$Multiplication: $$ab=ba $$ |
| Distributive Property | A property of algebra states that multiplying the sum of two or more addends by a number will give the same result as multiplying each addend individually by the number and then adding the products together. | $$a\left(b+c\right)=ab+ac$$ |
| Polynomial Identity | A polynomial equation that is always true for any value of the variables.  | Common Polynomial Identities:$$\left(a+b\right)^{2}=a^{2}+2ab+b^{2}$$$$\left(a−b\right)^{2}=a^{2}−2ab+b^{2}$$$$\left(a−b\right)\left(a+b\right)=a^{2}−b^{2}$$$$a^{3}+a^{3}=\left(a+b\right)\left(a^{2}−ab+b^{2}\right)$$$$a^{3}−a^{3}=\left(a−b\right)\left(a^{2}+ab+b^{2}\right)$$ |
| Rational Expression | An expression that is the ratio of two polynomials. |  |
| Keep, Flip, Change | “Keep, Flip, Change” is a mnemonic device to follow when changing a division problem into a multiplication problem. |  |
| Quadratic Formula | The quadratic formula is a general formula for finding the solution to a quadratic equation. | $$x=\frac{−b\pm \sqrt{b^{2}−4ac}}{2a}$$where *a*, *b*, and *c* are the coefficients and constant of the terms in a quadratic equation$$ax^{2}+bx+c$$. |
| Zero Product Property of Multiplication | The Zero Product Property holds that if the product of two or more factors is zero, then at least one factor must be zero. | If $$ab=0 $$, then $$a=0, b=0,  $$or both $$a $$and $$b $$equal to zero. |
| Multiplication Property of Equality | Multiplication Property of Equality says that you can multiply both sides of an equation by a non-zero quantity without changing the solutions to the equation. | If $$a=b $$then $$a⋅c=b⋅c $$ |