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| Sometimes we need to solve for a variable that isn’t already by itself. To do this we rearrange the equations using an ***INVERSE OPERATIONS*** method. This means you “undo” or “reverse” what is in front of you. Order of operations (BEDMAS) is performed in **reverse** order. |

**TYPE 1: *Single step Equations***

1. *In this types of equations, the coefficient of x is 1. Simply there is only one x. Example x vs. 2x*

Solve for *x.*

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| a) | b) | c) | d) |

**TYPE 2: *Multi step Equations***

2. *When the coefficient of x is different than one, we follow the opposite of BEDMAS …Start with subtraction or addition before multiplication or division.*

**USING ARROW DIAGRAM**

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| 2x2 – 4 = 28, solve for x.  **Step 1**: Sketch an arrow diagram that shows you which steps to take to get to the answer 28.    **Step 2:** Now, update your diagram that shows you which steps to take to get to x from 28.    **Step 3:** Apply these operations to both side of your original equation  2x2 – 4 = 28  + 4 + 4 (1) Add 4 to both sides  2x2 = 32  ÷2 ÷2 (2) Divide both sides by 2  x2 = 16  √ √ (3) Square root both sides  x = 4 |

Solve for *x. You can use arrow diagram to assist you visually.*

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| a) | b) | c) 4x2 – 4 = 12 | d) 3x2 + 3 = 78 |

**REARRANGING FORMULAS**

Formulas usually express one variable in terms of one or more variables. We can use our knowledge of equations and inverse operations to rewrite the formula in terms of a different variable.

**EXAMPLE 1:** Rearrange each formula to isolate variable *P*.

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**EXAMPLE 2:** Rearrange V = lwh to isolate h.

**EXAMPLE 3:** Rearrange E = IR (Ohm’s Law) to isolate R.

**SOLVING PROBLEMS BY REARRANGING FORMULAS**

*Substitute given value, then rearrange.*

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| Convert 30oC to degrees Fahrenheit. Use the formula  . | **EXAMPLE 4:** The area, A, of a circle with radius r is given by A = πr2. Use the formula to determine the  radius of a circular oil spill that covers an area of 5.0 km2. |

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