**VARIABLES** are symbols used to represent unspecified numbers or values. Any letter can be used as a variable.

**ALGEBRAIC EXPRESSION** consists of one or more numbers and variables along with one or more arithmetic operation.

Various ways to represent a product of and :

In each expression above, the quantities being multiplied are called **factors**, and the result is called the **product**.

Translating Verbal Expression into Algebraic Expression:

|  |  |  |  |
| --- | --- | --- | --- |
| **Addition** | **Subtraction** | **Multiplication** | **Division** |
| Plus | Minus | Times | Divided |
| Sum of | Difference between/of | Product of | Quotient of |
| More than | Less than | Multiplied by | Ratio of |
| Increased by | Decreased by |  | Per |
| Combined | Fewer than |  | Out of |
| Together |  |  | percent |
| Total of  |  |  |  |
| Added to |  |  |  |

**Example**: three more than a number

|  |  |  |  |
| --- | --- | --- | --- |
| **Verbal Expression:** | three | more than | a number  |
|  |  |  |  |
| **Algebraic Expression:** |  |  |  |

**Sample Problem 1**: Write each expression algebraically.

1. The product of 8 and a number
2. The difference between 16 and squared
3. The sum of 7 and
4. divided by three
5. Four times eight plus

**POWER** is an expression that represents repeated multiplication of the same factor.

where: = base

 = exponent, which corresponds to the number of times the base is used as a factors

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Words** | **Meaning** |
|  |  to the first power |  |
|  |  to the second power |  |
|  |  to the third power |  |
|  |  to the fourth power |  |
|  |  to the fifth power |  |
|  |  times to the sixth power |  |
|  |  to the th power |  |

**Example**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Power:** |  |  |  |
| **Base:** |  |  |  |
| **Exponent:** |  | 6 factors of 2 |  |

**Sample Problem 2**: Find each value.

1.
2.
3.
4.
5.

Translating Algebraic Expression into Verbal Expression:

**Example**: 4m

|  |  |  |  |
| --- | --- | --- | --- |
| **Algebraic Expression:** | 4 |  |  |
|  |  |  |  |
| **Verbal Expression:** | four | times | a number  |
|  | The product of 4 and  |

**Sample Problem 3**: Write a verbal expression for each algebraic expression.

1. = the difference between and
2. **=** the sum of and
3. **=** the ratio between and
4. **=** the product of and
5. **=** the difference between times and