**Chapter 1 Study Guide:**

**Complete the sentences below with vocabulary words.**

1. The exponent tells how many times to use the base as a factor.
2. A numerical expression is a mathematical phrase made up of numbers and operations.
3. An equation is a mathematical statement that two expressions are equal in value.
4. An algebraic expression consists of constants, variables, and operations.

**Identify a possible pattern. Use the pattern to write the next three numbers.**

|  |  |  |
| --- | --- | --- |
| 1. 6, 10, 14, 18…   Add 4  22, 26, 30 | 1. 15, 35, 55, 75…   Add 20  95, 115, 135 | 1. 7, 14, 21, 28…   Add 4  35, 42, 49 |
| 1. 8, 40, 200, 1000…   Multiply by 5  5000, 25000, 125000 | 1. 41, 37, 33, 29   Subtract 4  25, 21, 17 | 1. 68, 61, 54, 47   Subtract 7  40, 33, 26 |

**Find each value.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. 9^2   81 | 1. 10^1   10 | 1. 2^7   128 | 1. 1^7   7 | 1. 11^2   121 |

**Multiply.**

|  |  |  |
| --- | --- | --- |
| 1. 144 x 10^2   144 x 100  14,400 | 1. 1.32 x 10^3   1.32 x 1000  1320 | 1. 22 x 10^7   22 x 10,000,000  220,000,000 |

**Write each number in scientific notation.**

|  |  |  |
| --- | --- | --- |
| 1. 48,000   4.8 x 10^4 | 1. 7, 020, 000   7.02 x 10^6 | 1. 149,00   1.49 x 10^4 |

1. In 2006 the population of Switzerland was about 7.507 x 10^6. Write this population in standard form.

7.507 x 1,000,000

7,507,000

**Simplify each expression.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. 2 + (9-6) / 3   2 + 3/3  2 + 1  3 | 1. 12 x 3^2 – 5   12 x 9 – 5  98 – 5  93 | 1. 11 + 2 x 5 – (9 + 7)   11 + 10 – 16  21 – 16  5 | 1. 75 / 5^2 + 8^2   75/25 + 64  3 + 64  67 |

1. Lola decides to join a 15 mile walk-a-thon. Her parents give her $3 for each mile walked and her brother gives her $10. Simplify the expression 3 x 15 + 10 to find out how much money she raised.

3 x 15 + 10

45 + 10

55

**Tell which property is represented.**

|  |  |  |
| --- | --- | --- |
| 1. 42 + 17 = 17 + 42   Communative | 1. *m* + 0 = *m*   Identity | 1. 6 \* (x – 5) = 6 \* x – 6 \* 5   Associative |

**Simplify each expression. Justify each step.**

|  |  |
| --- | --- |
| 1. 28 + 15 + 22   28 + 22 = 50  50 + 15  65 | 1. 20 x 23 x 5   20 x 5 = 100  100 x 5  500 |

**Evaluate each expression for the given values of the variables.**

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| --- | --- | --- |
| 1. 4x – 5 for x = 6   4 x 6 – 5  24 – 5  19 | 1. 8y^3 + 3y for y=4   8(4^3) + 3(4)  8 x 64 + 12  512 + 12  524 | 1. n/5 + 6*m* – 3 for *n*=5 and *m*=2   5/5 + 6(2) – 3  1 + 12 – 3  13-3  10 |

**Write as an algebraic expression.**

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| --- | --- | --- |
| 1. 4 divided by the sum of a number and 12   4/ (n + 12) | 1. 2 times the difference of *t* and 11   2(t – 11) | 1. Missy spent $32 on *s* shirts. Write an algebraic expression to represent the cost of one shirt.   32/s |

**Simplify each expression.**

|  |  |  |
| --- | --- | --- |
| 1. 7*b*^2 + 8 + 3*b*^2   7b^2 + 3b^2 + 8  10b^2 + 8 | 1. 12*a*^2 + 4 + 3*a*^2 – 2   12a^2 + 3a^2 + 4 – 2  15a^2 + 2 | 1. X^2 + x^3 + x^4 + 5x^2   X^2 + 5x^2 + x^3 + x^4  6x^2 + x^3 + x^4 |

**Determine whether the given value of the variable is a solution.**

|  |  |  |
| --- | --- | --- |
| 1. b/12 = 3; b = 48   48/12 = 3  4 does not equal 3 | 1. 36 = n – 12; n = 48   36 = 48 – 12  36 = 36 | 1. 9x = 117; x = 12   9 x 12 = 117  108 does not equal 117 |

**Solve each equation. Then check.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. 8 + b = 16   8 – 8 + b = 16 – 8  B = 8 | 1. 20 = n – 12   12 + 20 = n – 12 + 12  32 = n | 1. 27 + c = 45   27-27 + c = 45-27  C = 18 | 1. t – 68 = 44   t – 68 + 68 = 44 + 68  t = 112 |

**Solve each equation. Then check.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. n/12 = 6   n/12 x 12 = 6 x 12  n = 72 | 1. 3p = 27   3/3p = 27/3  P = 9 | 1. d/14 = 7   d/14 x 14 = 7 x 14  d = 98 | 1. 6x = 78   6x/6 = 78/6  X = 13 |

1. Lee charges $8 per hour to baby-sit. Last month she earned $136. How many hours did Lee baby-sit last month?

136/8 = 17