**College Preparatory Integrated Mathematics Course II**

**Notebook**

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 1.1**

**Section 5.2**

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| **Learning Objective 1.1: Define polynomial, monomial, binomial, trinomial, and degree. (Section 5.2 Objective 1)****Read Section 5.2 on page 318 and 319 in the textbook an answer the questions below.** |
| **Definitions**1. A number or the product of a number and variables raised to powers is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a term is the numerical factor of each term.
3. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a finite sum of terms of the form $ax^{n}$ , where $a $is a real number and $n $

is a whole number.1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a polynomial with exactly one term.
2. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a polynomial with exactly two term.
3. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a polynomial with exactly three term.
4. The\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of a polynomial is the greatest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of any term of the polynomial.
 |

**Example 1: Find the degree of each term.**

**a)** $5y^{3}$ **b)** $10xy$

 **c)** $z$ **d)** $-3a^{2}b^{5}c$ **e)** $8$

**Example 2: Find the degree of each polynomial and tell whether the polynomial is a monomial, binomial, trinomial, or none of these.**

**a)**$5b^{2}-3b+7$ **b)**$7t+3$

**c)**$5x^{2}+3x-6x^{3}+4$ **d)** $1-x^{3}+x^{4}+x$

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| **Learning Objective 1.1: Define polynomial functions (Section 5.2 Objective 2)****Read Section 5.2 on page 320 in the textbook an answer the questions below.** |

**Example 3: If** $P\left(x\right)=2x^{2}-6x+1$**, find the following.**

 **a)**$P\left(1\right)=$

 **b)**$P\left(-3\right)=$

 **c)**$P\left(0\right)=$

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| **Learning Objective 1.1: Simplifying polynomials by combining Like Terms (Section 5.2 Objective 3)****Read Section 5.2 on page 322 in the textbook an answer the questions below.** |
| **Definitions**1. Terms that contain exactly the same variables raised to exactly the same power called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 4: Simplify each polynomial by combining any like terms.**

**a)**$-4y+2y$ **b)**$z+5z^{3}$

**c)**$15x^{3}-x^{3}$ **d)** $7a^{2}-5-3a^{2}-7$

**e)**$ \frac{3}{8}x^{3}-x^{2}+\frac{5}{6}x^{4}+\frac{1}{12}x^{3}-\frac{1}{2}x^{4}$

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| **Learning Objective 1.1: Add and Subtract polynomials (Section 5.2 Objective 4)****Read Section 5.2 on page 323 in the textbook an answer the questions below.** |
| **Definitions**1. To add polynomials, combine all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. To subtract two polynomials, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the signs of the terms of the polynomial being subtracted and then add.
 |

**Example 5: Add or subtract.**

**a)**$\left(2x^{2}+7x+6\right)+(x^{2}-6x^{2}-14)$

**b)**$\left(-14x^{3}-x+2\right)+(-x^{3}+3x^{2}+4x)$

**c)**$\left(8x^{2}-6x-7\right)-(3x^{2}-5x)$

**d)** $\left(2x-5\right)-(7x^{2}-2x+1)$

 **Homework: Page**

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**Learning Objective 1.1**

**Section 5.3**

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| **Learning Objective 1.1: Multiply monomials (Section 5.3 Objective 1)****Read Section 5.3 on page 330 in the textbook an answer the questions below.** |
| **Definitions**1. To multiply exponential expressions with a common base, \_\_\_\_\_\_\_\_\_\_ exponents.
 |

**Example 1: Multiply.**

1. $5y∙2y$

1. $(5z^{3})∙(-0.4z^{5})$

 **c)**$ (-\frac{1}{9}b^{6})∙(-\frac{7}{8}b^{3})$

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| **Learning Objective 1.1: Use the distributive property to multiply polynomials (Section 5.3 Objective 2)****Read Section 5.3 on page 331 in the textbook an answer the questions below.** |
| **Definitions**1. To multiply two polynomials, multiply each term of the first polynomial by each term of the second polynomial and then combine \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 2: Multiply.**

 **a)**$ (x-3)(x^{2}-6x+1)$

 **b)**$ (4a+3b)^{2}$

 **c)**$ (s+2t)^{3}$

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| **Learning Objective 1.1: Multiply polynomials vertically(Section 5.3 Objective 3)****Read Section 5.3 on page 333 in the textbook an answer the questions below.** |

**Example 3: Find the product using a vertical format.**

 **a)**$ (5x^{2}+2x-2)(x^{2}-x+3)$

 **b)**$ (2-x^{2})(2x^{2}+4x-1) $

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 1.1**

**Section 5.4**

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| **Learning Objective 1.1: Multiply two binomial using the FOIL method. (Section 5.4 Objective 1)****Read Section 5.4 on page 337 in the textbook an answer the questions below.** |
| **Definitions** **The FOIL method:**1. F stands for the product of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_terms.
2. O stands for the product of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_terms.
3. I stands for the product of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_terms.
4. L stands for the product of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_terms.
 |

**Example 1: Multiply.**

 **a)**$ 3\left(4x+1\right)(5-2x)$

 **b)**$ (4x-1)^{2}$

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| **Learning Objective 1.1: Square a binomial (Section 5.4 Objective 2)****Read Section 5.4 on page 338 in the textbook an answer the questions below.** |
| **Definitions**1. $(a+b)^{2}=a^{2}+\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_+b^{2}$
2. $(a-b)^{2}=a^{2}-\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_+b^{2}$
 |

**Example 2: Use a special product to square each binomial.**

 **a)**$ (b+3)^{2}$

 **b)**$ (x-y)^{2}$

1. $(3y+2)^{2}$
2. $(a^{2}-5b)^{2}$

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| **Learning Objective 1.1: Multiplying the sum and difference of two terms. (Section 5.4 Objective 3)****Read Section 5.4 on page 339 in the textbook an answer the questions below.** |
| **Definitions**1. $\left(a+b\right)\left(a-b\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_.$
 |

**Example 3: Use a special product to multiply.**

 **a)**$ 3(x+5)(x-5)$

 **b)**$ (4b-3)(4b+3)$

 **c)** $(x+\frac{2}{3})(x-\frac{2}{3})$

 **d)** $(5s-t)(5s+t)$

 **e)** $(2y-3z^{2})(2y+3z^{2})$

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| **Learning Objective 1.1: Using special products (Section 5.4 Objective 4)****Read Section 5.4 on page 340 in the textbook an answer the questions below.** |

**Example 4: Use a special product to multiply, if possible.**$ $**.**

 **a)**$ (4x+3)(x-6)$

 **b)**$ (7b-2)^{2}$

 **c)** $(x+0.4)(x-0.4)$

 **d)** $(x+1)(x^{2}+5x-2)$

 **e)** $(x^{2}-\frac{3}{7})(3x^{4}+\frac{2}{7})$

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**Learning Objective 1.1**

**Section 5.6**

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| **Learning Objective 1.1: Divide a polynomial by a monomial (Section 5.6 Objective 1)****Read Section 5.6 on page 353 in the textbook an answer the questions below.** |
| **Definitions**1. Fractions that have a common denominator are added by adding the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
 |

**Example 1: Divide.**

$\frac{15x^{4}y^{4}-10xy+y}{5xy}$

**Example 2: In which of the following is** $\frac{x+5}{5}$ **simplified correctly?**

1. $\frac{x}{5}+1$ **b)** $x$ **c)** $x+1$

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| **Learning Objective 1.1: Use long division to divide a polynomial by another polynomial (Section 5.6 Objective 2)****Read Section 5.6 on page 354 in the textbook an answer the questions below.** |
| **Definitions**1. In $18÷6=3$ , the 18 is the \_\_\_\_\_\_\_\_\_\_\_ , the 3 is the \_\_\_\_\_\_\_\_\_\_\_ , and the 6 is the \_\_\_\_\_\_\_\_\_\_\_ .
 |

**Example 3: Divide.**

 **a)**$ x^{3}+27$ **by** $x+3$

 **b)**$ x^{2}+2x-6$ **by** $x-2$

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**Learning Objective 1.1**

**Section 5.7**

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| **Learning Objective 1.1: Use Synthetic division to divide a polynomial by a binomial (Section 5.7 Objective 1)****Read Section 5.7 on page 360 in the textbook an answer the questions below.** |
| **Definitions**1. Which division problems are candidates for the synthetic division process?
2. $(3x^{2}+5)÷(x+4)$ c) $(y^{4}+y-3)÷(x^{2}+1)$
3. $(x^{3}-x^{2}+2)÷(3x^{3}-2)$ d) $x^{5}÷(x-5)$
 |

**Example 1: If** $P\left(x\right)=x^{3}-5x-2$ **,**

1. **Find** $P(2)$ **by substitution.**
2. **Use synthetic division to find the remainder when P(x) is divided by** $ x-2$ **.**

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| **Learning Objective 1.1: Using the Remainder Theorem (Section 5.7 Objective 2)****Read Section 5.7 on page 362 in the textbook an answer the questions below.** |
| **Definitions**1. By Remainder Theorem, if a polynomial $P(x)$ is divided by $x-c$, then the remainder is \_\_\_\_\_.
 |

**Example 2: Use the remainder theorem and synthetic division to find** $P(3)$ **if**

$P\left(x\right)=2x^{5}-18x^{4}+90x^{2}+59x$

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 1.9**

**Section 6.6**

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| **Learning Objective 1.9: Solve quadratic equations by factoring (Section 6.6 Objective 1)****Read Section 6.6 on page 413-416 in the textbook an answer the questions below.** |
| **Definitions**1. An equation that can be written in the form $ax^{2}+bx+c=0$, with $a\ne 0$, is called a \_\_\_\_\_\_\_\_\_\_\_\_\_ equation.
2. The form $ax^{2}+bx+c=0$ is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a quadratic equation.
3. If the product of two numbers is zero, then at least one of the numbers must be \_\_\_\_\_\_\_\_\_\_\_ .
4. If $a$ and $b$ are real numbers and if $a∙b=0$, then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
 |

**Example 1: Solve:**

1. $\left(x+4\right)\left(x-5\right)=0$
2. $\left(x-12\right)\left(4x+3\right)=0$
3. $x\left(7x-6\right)=0$
4. $x^{2}-8x-48=0$
5. $9x^{2}-24x=-16$
6. $x\left(3x+7\right)=0$
7. $-3x^{2}-6x+72=0$

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| **Learning Objective 1.9: Solve equations with degree greater than 2 by factoring (Section 6.6 Objective 2)****Read Section 6.6 on page 417 in the textbook an answer the questions below.** |

**Example 2: Solve:**

 **a)**$ 7x^{3}-63x=0$

 **b)** $\left(3x-2\right)\left(2x^{2}-13x+15\right)=0$

 **c)**$ 5x^{3}+5x^{2}-30x=0$

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| **Learning Objective 1.9: Find x-intercepts of the graph of a quadratic equation in two variables. (Section 6.6 Objective 3)****Read Section 6.6 on page 418 in the textbook an answer the questions below.** |
| **Definitions**1. The graph of a quadratic equation in the form $y=ax^{2}+bx+c$ where $a\ne 0$, is called\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 3: Find the x-intercepts of the graph of** $y=x^{2}-6x+8$**.**

**Example 4: Find the x-intercepts of the graph of** $y=x^{2}+4x+4$**.**

**Example 5: Find the x-intercepts of the graph of** $y=2x^{2}+2$**.**

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**Learning Objective 1.9**

**Section 6.7**

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| **Learning Objective 1.9: Solve problems that can be modeled by quadratic equations.(Section 6.7 Objective 1)****Read Section 6.7 on page 422-426 in the textbook an answer the questions below.** |
| **Definitions**1. In a right triangle, the side opposite the right angle is called the \_\_\_\_\_\_\_\_\_\_\_\_\_ .
2. In a right triangle, each side adjacent to the right angle is called a \_\_\_\_\_\_\_\_\_\_\_\_\_.
3. The Pythagorean theorem states that $(leg)^{2}+(leg)^{2}=(\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_)^{2}$
 |

**Example 1: The square of a number minus eight times the number is equal to forty-eight. Find the**

**number.**

**Example 2: Find two consecutive integers whose product is 41 more than their sum.**

**Example 3: Find the dimensions of a right triangle where the second leg is 1 unit less than double the first leg, and the hypotenuse is 1 unit more than double the length of the first leg.**

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 1.3**

**Section 7.2, 7.3, 7.4**

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| **Definitions**1. If $\frac{A}{B} $and $\frac{C}{D}$ are rational expressions, then $\frac{A}{B}∙\frac{C}{D}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. To divide two Rational Expressions, multiply the first rational expression by the $\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$ of the second rational expression.
 |

**Example 1:** Multiply $\frac{6x^{2}}{8x^{3}}∙\frac{16x}{12}$

**Example 2:** Multiply and simplify. $\frac{(x-y)^{2}}{x+y}∙\frac{x}{x^{2}-xy}$

1. Re-write above Rational expression by Factoring all numerators and denominators
2. Multiply numerators and multiply denominators without distributing
3. Simplify by dividing out common factors.

**Example 3:** Divide $\frac{4x^{3}y^{7}}{60}÷\frac{6x}{y^{3}}$

**Example 4:** Divide and simplify . $\frac{10}{x^{2}-4}÷\frac{5x}{2x+4}$

1. Re-write above Rational expression by multiplying by Reciprocal of second rational expression
2. Factor all numerators and denominators and multiply remaining factors
3. Simplify by dividing out common factors.

**Example 5:** Divide. $\frac{\left(x+3\right)^{2}}{4}÷\frac{4x+12}{16}$

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| **Learning Objective 1.3: Adding and Subtracting Rational Expressions with Common Denominators and Least Common Denominators****Read Section 7.3 on page 460 and answer the questions below.** |
| **Definitions**1. **If** $\frac{A}{B} $**and** $\frac{C}{B}$ **are rational expressions, then** $\frac{A}{B}+\frac{C}{B}=\frac{\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_}{B}$
2. **If** $\frac{A}{B} $**and** $\frac{C}{B}$ **are rational expressions, then** $\frac{A}{B}-\frac{C}{B}=\frac{\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_}{B}$
3. ***To add or subtract rational expressions, add or subtract*** $\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$***and place the sum or difference over the common denominator***$.$
4. **Us the distributive property to subtract 2x – (x + 3) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
 |

**Example 6:** Add. $\frac{5x-1}{4x}+\frac{2x-3}{4x}$

**Example 7:** Add. $\frac{4m-3}{2m+7}+\frac{3m+8}{2m+7}$

**Example 8:** Subtract. $\frac{8y}{y-3}-\frac{24}{y-3}$

**Example 9:** Subtract. $\frac{3x}{x^{2}+3x-10}-\frac{6}{x^{2}+3x-10}$

**Example 10:** Subtract. $\frac{7x+8}{9x+15}-\frac{5x-2}{9x+15}$

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| **Learning Objective 1.3: Adding and Subtracting Rational Expressions with Unlike Denominators****Read Section 7.4 on page 468 and answer the questions below.** |
| Definitions1. The least common denominator (LCD) is the product of all unique factors
2. If $\frac{A}{B} $and $\frac{C}{D}$ are rational expressions, then $\frac{A}{B}+\frac{C}{D}=\frac{\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_}{B}$
3. If $\frac{A}{B} $and $\frac{C}{D}$ are rational expressions, then $\frac{A}{B}-\frac{C}{D}=\frac{\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_}{B}$

Four Steps to Adding and Subtracting Rational Expressions with Unlike Denominators.Step 1: Find the LCD of all the rational expressions.Step 2: Rewrite each rational expression as an equivalent expression whose denominator is the  LCD found in Step 1.Step 3: Add or subtract numerators and write the sum or difference over the common  denominator.Step 4: Simplify or write the rational expression in simplest form. |

**Example 11:** Add. $\frac{15}{7a}+\frac{8}{6a}=$

**Example 12:** Add. $4+\frac{4}{x}$

**Example 13:** Add. $\frac{4}{x^{2}-x-6}+\frac{x}{x^{2}+5x+6}$

**Example 14:** Add. $\frac{9}{x^{2}+5x-6}+\frac{6}{x+6}$

**Example 15:** Subtract. $\frac{7}{2x-3}-3$

**Example 16:** Subtract. $1-\frac{1}{x}$

**Example 17:** Subtract . $\frac{5}{2x-6}-\frac{3}{6-2x}$

**Example 18:** Subtract . $\frac{x^{2}}{x}-\frac{2x+8}{2x}$

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**Learning Objective 1.4**

**Section 7.7**

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| **Learning Objective 1.4: Simplifying Complex Fractions** **Read Section 7.7 on page 495 and answer the questions below.** |
| **Definitions****Method 1: *Simplifying a Complex Fraction*****Step 1: Simplify the numerator and the denominator of the complex fraction so that each is a**  **single fraction.****Step 2: Perform the indicated division by multiplying the numerator of the complex fraction by**  **the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the denominator of the complex fraction.** **Step 3: Simplify if possible** **Method 2: *Simplifying a Complex Fraction*****Step 1: Multiply the numerator and the denominator of the complex fraction by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **of the fractions in both the numerator and the denominator.****Step 2: Simplify** |

**Example 1:** Use Method **1** above to simplify. $\frac{1 + \frac{1}{x}}{4 - \frac{4}{x}}$

Step1:

Step2:

Step3:

**Example 2:** Use Method **1** above to simplify. $\frac{\frac{x}{2}+2}{\frac{x}{4} - 4}$

**Example 3:** Use Method **2** above to simplify. $\frac{\frac{6x^{2}}{8x^{3}}}{\frac{12}{16x}}$

Step1:

Step2:

**Example 4:** Use Method 2 above to simplify. $\frac{\frac{1}{y^{2}}+\frac{2}{3}}{\frac{1}{y}-\frac{5}{6}}$

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**Learning Objective 1.6**

**Section 10.2 and 10.3**

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| **Learning Objective 1.6: Simplifying Rational Exponents** **Read Section 10.2 on page 596 and answer the questions below.** |
| **Definitions**1. ***If n is a positive integer greater than 1, then fill in the blank*** $a^{\frac{1}{n}}= \sqrt{a}$
2. **If m and n are positive integers greater than 1, with m/n in simplest form, then fill in the blanks :** $a^{\frac{m}{n}}= \sqrt[n]{a^{}}=\left(\sqrt[n]{a}\right)^{}$
3. **If** $a^{\frac{m}{n}}$ **is a nonzero real number, then fill in the blanks:** $a^{-\frac{m}{n}}=\frac{1}{a^{\frac{}{}}}$
 |

**Example 1:** Use radical notation to write the following. Simplify if possible. $81^{\frac{1}{4}}$

**Example 2:** Use radical notation to write the following. Simplify if possible. 

**Example 3:** Use radical notation to write the following. Simplify if possible. $-(16x^{8})^{\frac{1}{2} }$

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| **Learning Objective 1.6: Simplifying Radical Expressions****Read Section 10.3 on page 603 and answer the questions below.** |
| **Definitions**1. **Product Rule for Radicals: Fill in the blank** $\sqrt[n]{a}∙\sqrt[n]{b}=\sqrt[n]{\\_\\_\\_\\_\\_\\_\\_}$
2. **Quotient Rule for Radicals: Fill in the blanks:** $\sqrt[n]{\frac{a}{b}}=\frac{\sqrt[n]{}}{\sqrt[n]{}}$
 |

**Example 4:** Use rational exponents to write as a single radical**. **

**Example 5:** Use rational exponents to write as a single radical and Simplify.$\sqrt[3]{-343x^{6}}$

**Example 6:** Multiply and Simplify**. **

**Example 7:** Simplify**. **

**Example 8:** Use the quotient rule to divide, and simplify if possible 

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**Learning Objective 1.7**

**Section 10.4**

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| **Learning Objective 1.7: Add or subtract radical expressions (Section 10.4 Objective 1)****Read Section 10.4 on page 611 in the textbook an answer the questions below.** |
| **Definitions**1. Radicals with the same index and the same radicand are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . |

**Example 1: Add or subtract. Assume that variables represent positive real numbers.**

**a)** $3\sqrt{17}+5\sqrt{17}$ **b)**$7\sqrt[3]{5z}-12\sqrt[3]{5z}$

**Example 2: Add or subtract. Assume that variables represent positive real numbers.**

**a)**$\sqrt{24}+3\sqrt{54}$ **b)**$\sqrt[3]{24}-4\sqrt[3]{81}+\sqrt[3]{3}$

**c)**$\sqrt{75x}-3\sqrt{27x}+\sqrt{12x}$ **d)** $\frac{\sqrt{28}}{3}-\frac{\sqrt{7}}{4}$

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| **Learning Objective 1.7: Multiply radical expressions (Section 10.4 Objective 2)****Read Section 10.4 on page 614 in the textbook an answer the questions below.** |

**Example 3: Multiply.**

 **a)**$\sqrt{5}(2+\sqrt{15})$ **b)**$(\sqrt{2}-\sqrt{5})(\sqrt{6}+2)$

 **c)** $(\sqrt{6}-3)^{2}$ **d)** $(3\sqrt{z}-4)(2\sqrt{z}+3)$

 **e)**$(\sqrt{x+2}+3)^{2}$

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**Learning Objective 1.7**

**Section 10.5**

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| **Learning Objective 1.7: Rationalize denominators (Section 10.5 Objective 1)****Read Section 10.5 on page 617 in the textbook an answer the questions below.** |
| **Definitions**1. The process of writing an equivalent expression, but without a radical in the denominator is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
 |

**Example 1: Rationalize the denominator of each expression.**

 **a)**$ \frac{5}{\sqrt{3}}$ **b)**$ \frac{3\sqrt{25}}{\sqrt{4x}}$ **c)**$\sqrt[ 3]{\frac{2}{9}}$

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| **Learning Objective 1.7: Rationalize denominators having two terms (Section 10.5 Objective 2)****Read Section 10.5 on page 619 in the textbook an answer the questions below.** |
| **Definitions**1. Two expressions $a+b $ and $a-b $are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 2: Rationalize the denominator.**

 **a)**$ \frac{5}{3\sqrt{5}+2}$ **b)**$ \frac{\sqrt{2}+5}{\sqrt{3}-\sqrt{5}}$ **c)**$ \frac{3\sqrt{x}}{2\sqrt{x}+\sqrt{y}}$

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| **Learning Objective 1.7: Rationalize numerators (Section 10.5 Objective 3)****Read Section 10.5 on page 620 in the textbook an answer the questions below.** |
| **Definitions**1. The process of writing an equivalent expression, but without a radical in the numerator is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 3: Rationalize numerator.**

 **a)**$ \frac{\sqrt{32}}{\sqrt{80}}$ **b)**$ \frac{\sqrt[3]{5b}}{\sqrt[3]{2a}}$ **c)**$ \frac{\sqrt{x}-3}{4}$

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**Learning Objective 1.7**

**Section 10.6**

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| **Learning Objective 1.7: Simplifying Radical Expressions and Solve Radical Equations****Read Section 10.6 on page 624 and answer the questions below.** |
| **Definitions**1. **Power Rule: Fill in the blanks: If both sides of an equation are raised to the same power, *\_\_\_\_\_\_\_* solutions of the original equation are *among* the solutions of the \_\_\_\_\_\_\_\_\_\_ equation.**
2. **Pythagorean Theorem: If *a* and *b* are lengths of the legs of a right triangle and *c* is the length of the hypotenuse, then fill in the blanks: \_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_**
 |

**Example 1:** Solve. 

**Example 2:** Solve $x\sqrt{2}=\sqrt{9}$

**Example 3:** Solve. 

**Example 4:** Solve. 

**Example 5:** Solve. 

**Example 6:** Find the length of the hypotenuse of a right triangle when the length of the two legs are 2 inches and 7 inches.

**Example 7:** Find the length of the leg of a right triangle. Give the exact length and a two-decimal-approximation. Let *a* = 2 meters and *c* = 9 meters

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**Learning Objective 1.9**

**Section 11.1**

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| **Learning Objective 1.9: Use the square root property to solve quadratic equations.(Section 11.1 Objective 1)****Read Section 11.1 on page 652 in the textbook an answer the questions below.** |
| **Definitions**1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ equation is an equation that can written in the form $x^{2}+bx+c$ .
2. If $b $is a real number and if $a^{2}=b$, then $a=$\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 1: Use square root property to solve equations.**

1. $x^{2}=32$ **b)**$ 5x^{2}-50=0$

 **c)**$ (x+3)^{2}=20$ **d)** $(5x-2)^{2}+2=-7$

|  |
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| **Learning Objective 1.9: Solving by completing the square (Section 11.1 Objective 2)****Read Section 11.1 on page 654 in the textbook an answer the questions below.** |
| **Definitions**1. The process of writing a quadratic equation so that one side is a perfect square trinomial is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
2. A perfect square trinomial is one that can be factored as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ squared.
3. To solve $x^{2}+6x=10 $by completing the square, add \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to both sides.
4. To solve $x^{2}+bx=c$ by completing the square, add \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to both sides.
 |

**Example 2: Solve equations by completing the square.**

 **a)**$ b^{2}+4b=3$

 **b)** $2x^{2}-5x+7=0$

 **c)**$ 3x^{2}-12x+1=0$

|  |
| --- |
| **Learning Objective 1.9: Solving problems modeled by quadratic equations (Section 11.1 Objective 3)****Read Section 11.1 on page 657 in the textbook an answer the questions below.** |
| **Definitions**1. The formula $I=Prt $ is a formula for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
2. The interest computed on money borrowed or money deposited is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
 |

**Example 3: Use the formula** $A=P(1+r)^{t}$ **to find the interest rate** $r$ **if $5000 compounded annually grows to $5618 in 2 years.**

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 1.9**

**Section 11.2**

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| **Learning Objective 1.9: Solve quadratic equations by using the quadratic formula.(Section 11.2 Objective 1)****Read Section 11.2 on page 662 in the textbook an answer the questions below.** |
| **Definitions**1. The quadratic equation written in the form $x^{2}+bx+c=0$ , when $a\ne 0$ has the solutions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
 |

**Example 1: Solve equations by using quadratic formula.**

 **a)**$ 3x^{2}-5x-2=0$

 **b)** $ 3x^{2}-8x=2$

 **c)**$ \frac{1}{8}x^{2}-\frac{1}{4}x-2=0$

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| **Learning Objective 1.9: Determine the number and type of solutions of a quadratic equation by using the discriminant.(Section 11.2 Objective 2)****Read Section 11.2 on page 665 in the textbook an answer the questions below.** |
| **Definitions**1. The radicand $b^{2}-4ac$ is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
2. If $b^{2}-4ac$ is positive, the quadratic equation has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solutions.
3. If $b^{2}-4ac$ is zero, the quadratic equation has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solutions.
4. If $b^{2}-4ac$ is negative, the quadratic equation has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solutions.
 |

**Example 2: Use the discriminant to determine the number and type of solutions of each quadratic equation.**

 **a)**$ x^{2}-6x+9=0$ **b)** $ x^{2}-3x-1=0 $ **c)**$ 7x^{2}+11=0$

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| --- |
| **Learning Objective 1.9: Solve problems modeled by quadratic equations.(Section 11.2 Objective 3)****Read Section 11.2 on page 666 in the textbook an answer the questions below.** |

**Example 3: A toy rocket is shot upward from the top of a building, 45 feet high, with an initial velocity of 20 feet per second. The height** $h$ **in feet of the rocket after** $t$ **seconds is**

$ h=-16t^{2}+20t+45$

**How long after the rocket is launched will it strike the ground? Round to the nearest tenth of a second.**

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 1.9**

**Section 11.3**

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| **Learning Objective 1.9: Solve various equations that are quadratic in form.(Section 11.3 Objective 1)****Read Section 11.3 on page 672 in the textbook an answer the questions below.** |
| **Definitions**1. The best way to solve the quadratic equation in the form $(ax+b)^{2}=c$ is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 1: Solve:**

 **a)**$ x-\sqrt{x+1}-5=0$

 **b)** $ \frac{5x}{x+1}-\frac{x+4}{x}=\frac{3}{x(x+1)}$

 **c)**$ p^{4}-7p^{2}-144=0$

 **d)**$ (x-3)^{2}-3\left(x-3\right)-4=0$

|  |
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| **Learning Objective 1.9: Solve problems that lead to quadratic equations.(Section 11.3 Objective 2)****Read Section 11.3 on page 675 in the textbook an answer the questions below.** |
| **Definitions**1. Four steps to solve a word problem are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 2: Together, Katy and Steve can groom all the dogs at the Barkin’ Doggies Day Care in 4 hours. Alone, Katy can groom the dogs 1 hour faster than Steve can groom the dogs alone. Find the time in which each of them can groom the dogs alone.**

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 2.1**

**Section 11.4**

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| **Learning Objective 2.1: Solve polynomial inequalities of degree 2 or more.(Section 11.4 Objective 1)****Read Section 11.4 on page 682 in the textbook an answer the questions below.** |
| **Definitions**1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an inequality that can be written so that one side is a quadratic expression and the other side is 0.
2. An inequality is written in standard form if one side is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the other side is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 1: Solve inequalities.**

 **a)**$ (x-4)(x+3)>0$

 **b)** $ x^{2}-8x\leq 0$

 **c)**$ (x+3)(x-2)(x+1)\leq 0$

|  |
| --- |
| **Learning Objective 2.1: Solve inequalities that contain rational expressions with variables in the denominator.(Section 11.4 Objective 2)****Read Section 11.4 on page 685 and 686 in the textbook an answer the questions below.** |
| **Definitions**1. The first step to solve a rational inequality is solve for values that make all denominators \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. An \_\_\_\_\_\_\_\_\_\_\_\_\_\_**interval** does not include its endpoints, and is indicated with parentheses.
3. A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **interval** includes its endpoints, and is denoted with square brackets.
 |

**Example 2: Solve inequalities.**

 **a)**$ \frac{x-5}{x+4}\leq 0$

 **b)** $ \frac{7}{x+3}<5$

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 2.1**

**Section 11.5**

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| **Learning Objective 2.1: Graph Quadratic Functions and Inequalities****Read Section 11.5 on page 689 and answer the questions below.** |
| **Definitions**1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a function that can be written in the form $f\left(x\right)=ax^{2}+bx+c$, where $a$, $b$, and $c$ are real numbers and $a\ne 0$.
2. If $a>0$, the parabola opens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. If $a<0$, the parabola opens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a parabola is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ point if the graph opens upward and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ point if the parabola opens downward.
5. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the vertical line that passes through the vertex.

 |

**Example 1:** Graph each quadratic function on the same coordinate plane. Label the vertex and sketch and label the axis of symmetry.

|  |  |  |
| --- | --- | --- |
| a. | $$f\left(x\right)=x^{2}$$ |  |
| b. | $$f\left(x\right)=x^{2}+2$$ |
| c. | $$f\left(x\right)=x^{2}-3$$ |
|  |  |

|  |
| --- |
| **Definition**: Graphing the Parabola Defined by $f\left(x\right)=x^{2}+k$1. If $k$ is positive, the graph of $ f\left(x\right)=x^{2}+k$ is the graph of $y=x^{2}$ shifted \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. If $k$ is negative, the graph of $ f\left(x\right)=x^{2}+k$ is the graph of $ y=x^{2}$ shifted \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. The vertex is \_\_\_\_\_\_\_\_\_\_\_ and the axis of symmetry is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 2:** Graph each quadratic function on the same coordinate plane. Label the vertex and sketch and label the axis of symmetry.

|  |  |  |
| --- | --- | --- |
| a. | $$f\left(x\right)=x^{2}$$ |  |
| b. | $$f\left(x\right)=(x-2)^{2}$$ |
| c. | $$f\left(x\right)=(x+3)^{2}$$ |
|  |  |

|  |
| --- |
| **Definition:** Graphing the Parabola Defined by $f\left(x\right)=\left(x-h\right)^{2}$1. If $h$ is positive, the graph of $f\left(x\right)=\left(x-h\right)^{2}$ is the graph of $y=x^{2}$ shifted to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. If $h$ is negative, the graph of $f\left(x\right)=\left(x-h\right)^{2}$ is the graph of $y=x^{2}$ shifted to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. The vertex is \_\_\_\_\_\_\_\_\_\_\_ and the axis of symmetry is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Definition: Graphing the Parabola Defined by $f\left(x\right)=\left(x-h\right)^{2}+k$1. The parabola has the same shape as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. The vertex is \_\_\_\_\_\_\_\_\_\_\_\_ and the axis of symmetry is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 3:** Graph each quadratic function. Label the vertex and sketch and label the axis of symmetry.

|  |  |  |
| --- | --- | --- |
| a. | $$f\left(x\right)=(x-2)^{2}+1$$ |  |
|  |  |  |
| b. | $$f\left(x\right)=(x+1)^{2}-3$$ |  |

**Example 4:** Graph each quadratic function on the same coordinate plane. Label the vertex and sketch and label the axis of symmetry.

|  |  |  |
| --- | --- | --- |
| a. | $$f\left(x\right)=x^{2}$$ |  |
| b. | $$f\left(x\right)=2x^{2}$$ |
| c. | $$f\left(x\right)=\frac{1}{2}x^{2}$$ |
|  |  |

|  |
| --- |
| **Definition:** Graphing the Parabola Defined by $f\left(x\right)=ax^{2}$1. If $\left|a\right|>1$, the graph of the parabola is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than the graph of $y=x^{2}$.
2. If $\left|a\right|<1$, the graph of the parabola is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than the graph of $y=x^{2}$**.**
 |

**Example 5:** Graph each quadratic function on the same coordinate plane. Label the vertex and sketch and label the axis of symmetry.

|  |  |  |
| --- | --- | --- |
| a. | $$f\left(x\right)=x^{2}$$ |  |
| b. | $$f\left(x\right)=-x^{2}$$ |
|  |  |
|  |  |

|  |
| --- |
| **Definition:** Graph of a Quadratic Function1. The graph of a quadratic function written in the form $f\left(x\right)=a\left(x-h\right)^{2}+k$ is a parabola with vertex \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. If $a>0$, the parabola opens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. If $a<0$, the parabola opens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The axis of symmetry is the line whose equation is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 |

**Example 6:** Graph each quadratic function. Label the vertex and two other points on the graph. Sketch and label the axis of symmetry.

|  |  |  |
| --- | --- | --- |
| a. | $$f\left(x\right)=-2(x-3)^{2}+4$$ |  |
|  |  |  |
| b. | $$f\left(x\right)=\frac{1}{3}(x+3)^{2}-2$$ |  |
|  |  |

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 2.1**

**Section 11.6**

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| **Learning Objective 2.1: Graph Quadratic Functions and Inequalities****Read Section 11.6 on page 697 and answer the questions below.** |
| **Definitions**1. Thegraph of a quadratic function is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. To write a quadratic function in the form $f\left(x\right)=a\left(x-h\right)^{2}+k$, we **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
 |

**Example 1:** Graph $f\left(x\right)=x^{2}+6x+9$. Find the vertex and any intercepts.

|  |  |  |
| --- | --- | --- |
|  |  |  |
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**Example 2:** Graph $f\left(x\right)=-2x^{2}+4x+6$. Find the vertex and any intercepts.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |
|  |  |
|  |  |

**Example 3:** Graph $f\left(x\right)=x^{2}+x+6$. Find the vertex and any intercepts.

|  |  |  |
| --- | --- | --- |
|  |  |  |

**Example 4:** Complete the square on $y=ax^{2}+bx+c$ and write the equation in the form

$$y=a\left(x-h\right)^{2}+k$$

|  |
| --- |
| **Definition: Vertex Formula** 1. The graph of $f\left(x\right)=ax^{2}+bx+c$, when $a\ne 0$, is a parabola with vertex \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
 |

**Example 5:** Find the vertex of the graph of each quadratic function. Determine whether the graph opens upward or downward, find any intercepts, and graph the function.

|  |  |  |
| --- | --- | --- |
| a. | $$f\left(x\right)=x^{2}+5x+4$$ |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |  |
|  |  |  |
| b. | $$f\left(x\right)=x^{2}-4x+4$$ |
|  |  |

|  |
| --- |
| **Definition**: Minimum and Maximum Values1. The quadratic function whose graph is a parabola that opens upward has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. The quadratic function whose graph is a parabola that opens downward has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the vertex is the minimum or maximum value of the function**.**
 |

**Example 6:** An arrow is fired into the air with an initial velocity of 96 feet per second. The height in feet of the arrow $t$ seconds after it was shot into the air is given by the function $h\left(x\right)=-16t^{2}+96t$. Find the maximum height of the arrow.

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 3.1**

**Section 2.4**

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| **Learning Objective 3.1: Solve Word Problems****Read Section 2.4 on page 104 and answer the questions below.** |
| **Definitions:** General Strategy for Problem Solving1. UNDERSTAND the problem. Some ways of doing this are to:
*
*
*
1. TRANSLATE the problem into an equation.
2. SOLVE the equation.
3. INTERPRET the result: *Check* the proposed solutions in the stated problem and state your conclusion.
 |

**Example 1 – Solving Direct Translation Problems:** Eight is added to a number and the sum is doubled. The result is 11 less than the number. Find the number.

**Example 2 – Solving Direct Translation Problems:** Three times the difference of a number and 2 is equal to 8 subtracted from twice a number. Find the integers.

**Example 3 – Solving Problems Involving Relationships Among Unknown Quantities:** A 22-ft pipe is cut into two pieces. The shorter piece is 7 feet shorter than the longer piece. What is the length of the longer piece?

**Example 4 – Solving Problems Involving Relationships Among Unknown Quantities:** A college graduating class is made up of 450 students. There are 206 more girls than boys. How many boys are in the class?

**Example 5 – Solving Consecutive Integer Problems:** The room numbers of two adjacent hotel rooms are two consecutive odd numbers. If their sum is 1380, find the hotel room numbers.

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 3.1**

**Section 2.5**

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| **Learning Objective 3.1: Solve Word Problems****Read Section 2.5 on page 115 and answer the questions below.** |
| **Definitions**1. An equation that describes a known relationship among quantities, such as distance, time, volume, weight, and money, is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. These quantities are represented by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and are thus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the formula.
 |
| Common Formulas

|  |  |
| --- | --- |
| *Formulas* | *Their Meanings* |
| $$A=lw$$ |  |
| $$I=PRT$$ |  |
| $$P=a+b+c$$ |  |
| $$d=rt$$ |  |
| $$V=lwh$$ |  |
| $$F=\left(\frac{9}{5}\right)C+32$$or$$F=1.8C+32$$ |  |

 |

**Example 1 – Using Formulas to Solve Problems:** Substitute the given values into each given formula and solve for the unknown variable. If necessary, round to one decimal place.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Distance Formula$d=rt$; $t=9$, $d=63$  | b. | Perimeter of a rectangle$P=2l+2w$; $P=32$, $w=7$ |
| c. | Volume of a pyramid$V=\frac{1}{3}Bh$; $V=40$, $h$=8 | d. | Simple interest$I=prt$; $I=23$, $p=230$, $r=0.02$ |

**Example 2 – Using Formulas to Solve Problems:** Convert the record high temperature of $102°$F to Celsius.

**Example 3 – Using Formulas to Solve Problems:** You have decided to fence an area of your backyard for your dog. The length of the area is 1 meter less than twice the width. If the perimeter of the area is 70 meters, find the length and width of the rectangular area.

**Example 4 – Using Formulas to Solve Problems:** For the holidays, Christ and Alicia drove 476 miles. They left their house at 7 a.m. and arrived at their destination at 4 p.m. They stopped for 1 hour to rest and re-fuel. What was their average rate of speed?

**Example 5 – Solving a Formula for One of Its Variables:** Solve each formula for the specified variable.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Area of a triangle$A=\frac{1}{2}bh$ for $b$ | b. | Perimeter of a triangle$P=s\_{1}+s\_{2}+s\_{3}$ for $s\_{3}$ |
| c. | Surface area of a special rectangular box$S=4lw+2wh$ for $l$ | d. | Circumference of a circle$C=2πr$ for $r$ |

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 3.1**

**Section 2.6**

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| **Learning Objective 3.1: Solve Word Problems****Read Section 2.6 on page 126 and answer the questions below.** |
| Review: General Strategy for Problem Solving1. UNDERSTAND the problem.
2. TRANSLATE the problem into an equation.
3. SOLVE the problem.
4. INTERPRET the results: *Check* the proposed solution in the stated problem and *state* your conclusion.
 |

**Example 1 – Solving Percent Equations:** Find each number described.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | $5\%$ of $300$ is what number? | b. | $207$ is $90\%$ of what number? |
| c. | $15$ is $1\%$ of what number? | d. | What percent of $350$ is 420? |

**Example 2 – Solving Discount and Mark-up Problems:** A “Going-Out-Of-Business” sale advertised a $75\%$ discount on all merchandise. Find the discount and the sale price of an item originally priced at $\$130$. If needed, round answers to the nearest cent.

**Example 3 – Solving Discount and Mark-up Problems:** Recently, an anniversary dinner cost $\$145.23$ excluding tax. Find the total cost if a $15\%$ tip is added to the cost.

**Example 4 – Solving Percent Increase and Percent Decrease Problems:** In 2004, a college campus had $8,900$ students enrolled. In 2005, the same college campus had $7,600$ students enrolled. Find the percent decrease. Round to the nearest whole percent.

**Example 5 – Solving Mixture Problems:** How much pure acid should be mixed with $4$ gallons of a $30\%$ acid solution in order to get an $80\%$ acid solution? Use the following table to model the situation.

|  |  |
| --- | --- |
|  |  Number of Gallons $∙$ Acid Strength $=$ Amount of Acid |
| Pure Acid |  |  |  |
| $30\%$ Acid Solution |  |  |  |
| $80\%$ Acid Solution Needed |  |  |  |

**College Preparatory Integrated Mathematics Course II**

**Learning Objective 4.1**

**Section 8.2**

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| --- |
| **Learning Objective 3.1: Recognize functional notation and evaluate functions.****Read Section 8.2 on page 519 and answer the questions below.** |
| **Definition:** (Review from Section 3.6, pg. 226)1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a set of ordered pairs that assigns to each $x$-value exactly one $y$-value.
2. The variable $x$ is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because any value in the domain can be assigned to $x$.
3. The variable $y$ is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because its value depends on $x$.
4. The symbol $f\left(x\right)$ means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is read “$f$ of $x$.” This is called function notation and $y=f(x)$.
 |

**Example 1:** For each given function value, write a corresponding ordered pair.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a. | $$f\left(3\right)=6$$ | b. | $$g\left(0\right)=-\frac{1}{2}$$ | c. | $$h\left(-2\right)=9$$ |

**Example 2:** Use the graph of the following function $f\left(x\right)$ to find each value. Write the corresponding ordered pair for each.

|  |  |  |
| --- | --- | --- |
| a. | $$f\left(1\right)=$$ |  |
| b. | $$f\left(-3\right)=$$ |
| c. | $$f\left(0\right)=$$ |
| d. | Find $x$ such that $f\left(x\right)=2$. |
| e. | Find $x$ such that $f\left(x\right)=0$. |

**Example 2:** For each function, find the value of $f\left(-3\right)$, $f\left(2\right)$, and $f\left(0\right)$. Then write the corresponding ordered pairs.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a. | $$f\left(x\right)= -\frac{1}{3}x-5$$ | b. | $$f\left(x\right)=3x^{2}-2x-2$$ | c. | $$f\left(x\right)= \left|-3-x\right|$$ |
|  |  |  |  |  |  |
|  | $$f\left(-3\right)=$$ |  | $$f\left(-3\right)=$$ |  | $$f\left(-3\right)=$$ |
|  | $$f\left(2\right)=$$ |  | $$f\left(2\right)=$$ |  | $$f\left(2\right)=$$ |
|  | $$f\left(0\right)=$$ |  | $$f\left(0\right)=$$ |  | $$f\left(0\right)=$$ |