Name:

Common Core Algebra II

Unit 1

Polynomials and Factoring Honors Supplement

Mr. Schlansky

Operations with Polynomials Supplement

1) Perform the operation with polynomials
2) List the specified values
3) Perform the operation with integers

Identities Supplement

1) Put both sides in standard form using operations with polynomials.
2) Set the coefficients of the left hand side equal to the corresponding coefficients on the right hand side.
3) Solve for each variable.

Undefined

Set the denominator equal to zero

Multiplying/Dividing Rational Expressions

1) For division, multiply by the reciprocal (keep, change, flip)
2) Factor all of the top and bottom polynomials (Four separate factoring problems).
3) Cancel common factors.

*If the same factor is written backwards with a minus sign, they cancel to negative one.

Adding/Subtracting Rational Expressions

1) Find the LCD (Least Common Denominator)
    To find LCD:
    a) Integers: Find least common multiple (smallest integer every integer goes into).
    b) Variables: Put all factors in all denominators together.
2) Multiply top and bottom of each fraction by the missing factors.
3) Combine the numerators, keep the denominator.
4) Reduce the fraction if possible.

Name _____ Date _____
Mr. Schlansky Algebra II

Operations with Polynomials Supplement

1. The result when $6x^2 - 13x + 12$ is subtracted from $-3x^2 + 6x + 7$ is a polynomial in the form $ax^2 + bx + c$. What is the value of $a + b + c$?

2. The product of $2x^2 + 7x - 10$ and $x + 5$ is expressed in its standard form of $ax^3 + bx^2 + cx + d$. What is $a + b - d$?

3. When express in simplest form, $(3x^2 + 4x - 8) - (-2x^2 + 4x + 2)$ can be written as $ax^2 + bx + c$. What is the value of $2b + \frac{1}{2}c$?

4. The expression $5x + 4x^2(2x + 7) - 6x^2 - 9x$ is a polynomial which can be written in the form $ax^3 + bx^2 + cx + d$. What is the value of $2a - cd$?

Name _____ Date _____
Mr. Schlansky Algebra II

Identities Supplement

1. Solve for *h* and *k*: $3x^3 - 8x^2 + 13 = (3x^2 + hx - 4)(x - 2) + k$

2. Algebraically determine the values of *h* and *k* to correctly complete the identity stated below.
$2x^3 - 10x^2 + 11x - 7 = (x - 4)(2x^2 + hx + 3) + k$

3. Algebraically determine the values of *h* and *k* to correctly complete the identity stated below.
$x^3 - 8x^2 + 5x + 53 = (x - 5)^2(x + h) + k$

4. Solve for *a* and *b*: $(x + a)(x^2 - 3x + b) = x^3 - x^2 - 5x + 2$

Name _____ Date _____
Mr. Schlansky Algebra II

Undefined

Determine when the following rational expressions are undefined

1. $\frac{x^2}{2x-8}$

2. $\frac{12x-5}{x+3}$

3. $\frac{2x^2-3}{x^2-1}$

4. $\frac{5x-2}{x^2-2x-15}$

5. $\frac{8x-2}{x^2-100}$

6. $\frac{6x^2+1}{3x^2-2x-16}$

Name _____ Date _____
Mr. Schlansky Algebra II

Multiplying and Dividing Rational Expressions

1. $\dfrac{x^2-2x-15}{2y-8} \bullet \dfrac{12-3y}{x^2-25}$

2. $\dfrac{24a^3b^2}{7c^3} \bullet \dfrac{21c^2}{12ab}$

3. $\dfrac{y^2-81}{(y+9)^2} \bullet \dfrac{10y+90}{5y-45}$

4. $\dfrac{x^2+12x+36}{x^2-36} \bullet \dfrac{36-x^2}{2x+12}$

5. $\dfrac{15y^3}{2x^2+3x-2} \bullet \dfrac{1-4x^2}{10y}$

6. $\dfrac{x^2-5x+4}{2x} \div \dfrac{2x-2}{8x^2}$

7. $\dfrac{\dfrac{b^2-b-6}{2b}}{\dfrac{b^2-4}{b^2}}$

8. $\dfrac{\dfrac{x^2-x-2}{21-7z}}{\dfrac{x^2-6x+8}{z-3}}$

9. $\dfrac{\dfrac{x^2+5x+6}{3y^2}}{\dfrac{2x+4}{9y}}$

10. $\dfrac{x^2+9x-22}{x^2-121} \div (2-x)$

Name _____ Date _____
Mr. Schlansky Algebra II

Adding and Subtracting Fractions Rational Expressions

1. What is the sum of $\frac{2}{x}$ and $\frac{x}{2}$?

(1) 1
(3) $\frac{4+x}{2x}$
(2) $\frac{2+x}{2x}$
(4) $\frac{4+x^2}{2x}$

2. Which expression is equivalent to $\frac{a}{x}+\frac{b}{2x}$?

(1) $\frac{2a+b}{2x}$
(3) $\frac{a+b}{3x}$
(2) $\frac{2a+b}{x}$
(4) $\frac{a+b}{2x}$

3. The sum of $\frac{3}{x}+\frac{2}{5}$, $x \neq 0$, is

(1) $\frac{1}{x}$
(3) $\frac{5}{x+5}$
(2) $\frac{2x+15}{5x}$
(4) $\frac{2x+15}{x+5}$

4. What is the sum of $\frac{3}{7n}$ and $\frac{7}{3n}$?

(1) $\frac{1}{n}$
(3) $\frac{42}{21n}$
(2) $\frac{10}{21n}$
(4) $\frac{58}{21n}$

5. The expression $\frac{y}{x}-\frac{1}{2}$ is equivalent to

(1) $\frac{2y-x}{2x}$
(3) $\frac{1-y}{2x}$
(2) $\frac{x-2y}{2x}$
(4) $\frac{y-1}{x-2}$

6. Expressed as a single fraction, what is $\frac{1}{x+1}+\frac{1}{x}$, $x \neq 0,-1$?

(1) $\frac{2x+3}{x^2+x}$ (3) $\frac{2}{2x+1}$

(2) $\frac{2x+1}{x^2+x}$ (4) $\frac{3}{x^2}$

7. What is the sum of $\frac{3}{x-3}$ and $\frac{x}{3-x}$?

(1) 1 (3) $\frac{x+3}{x-3}$

(2) -1 (4) 0

8. Expressed as a single fraction, what is $\frac{1}{x+1}+\frac{1}{x}$, $x \neq 0,-1$?

(1) $\frac{2x+3}{x^2+x}$ (3) $\frac{2}{2x+1}$

(2) $\frac{2x+1}{x^2+x}$ (4) $\frac{3}{x^2}$

9. What is the sum of $(y-5)+\frac{3}{y+2}$?

(1) $y-5$ (3) $\frac{y-2}{y+2}$

(2) $\frac{y^2-7}{y+2}$ (4) $\frac{y^2-3y-7}{y+2}$

10. Express in simplest form: $\frac{1}{x}+\frac{1}{x+3}$

11. $\frac{2}{x-4}+\frac{3}{x+4}$

12. $\frac{9}{c+8}-\frac{2}{c}$

Name _____ Date _____
Mr. Schlansky Algebra II

Complex Fractions

1. The expression $\dfrac{1-\dfrac{x}{x-y}}{\dfrac{1}{x-y}}$ is equivalent to

(1) $1-x$ (3) y
(2) $x-y$ (4) $-y$

2. Which expression is equivalent to the complex fraction $\dfrac{\dfrac{1}{a}-a}{\dfrac{1}{a}+1}$?

(1) +1 (3) $1-a$
(2) -1 (4) $-(1-a)$

3. The expression $\dfrac{\dfrac{1}{3}-\dfrac{1}{x}}{\dfrac{3}{x}-1}$ is equivalent to

(1) $\dfrac{1}{3}$ (3) 3
(2) $-\dfrac{1}{3}$ (4) -3

4. The expression $\dfrac{\dfrac{1}{3}+\dfrac{1}{3x}}{\dfrac{1}{x}+\dfrac{1}{3}}$ is equivalent to

(1) $\dfrac{x+1}{x+3}$ (3) $\dfrac{3x+3}{x+3}$
(2) 2 (4) $\dfrac{1}{3}$

5. Written in simplest form, the expression $\dfrac{\frac{x}{4}-\frac{1}{x}}{\frac{1}{2x}+\frac{1}{4}}$ is equivalent to

(1) $x-1$ (3) $\dfrac{x-2}{2}$

(2) $x-2$ (4) $\dfrac{x^2-4}{x+2}$

6. Simplify: $\dfrac{\frac{x}{3}-\frac{3}{x}}{\frac{x-3}{x}}$

7. Express in simplest form: $\dfrac{x-\frac{4}{x}}{\frac{2+x}{x}}$

8. Express in simplest form: $\dfrac{\frac{1}{2}-\frac{4}{d}}{\frac{1}{d}+\frac{3}{2d}}$

Name _____ Date _____
Mr. Schlansky Algebra II

Factoring/Polynomials Supplemental Review Sheet

1. The product of $2x^2 + 7x - 10$ and $x + 5$ is expressed in its standard form of $ax^3 + bx^2 + cx + d$. What is $a + b - d$?

2. Solve for *h* and *k*: $3x^3 - 8x^2 + 13 = (3x^2 + hx - 4)(x - 2) + k$

3. For what value(s) of x is $\frac{x^2 - 3x - 4}{x^2 - 16}$ undefined?

4. Express the following in simplest form:

$$\frac{\frac{x^2 - x - 2}{21 - 7z}}{\frac{x^2 - 6x + 8}{z - 3}}$$

5. Express the following as a single fraction in simplest form:

$$\frac{x}{x-4} + \frac{2}{x}$$

6. Simplify: $\dfrac{\frac{x}{3} - \frac{3}{x}}{\frac{x-3}{x}}$