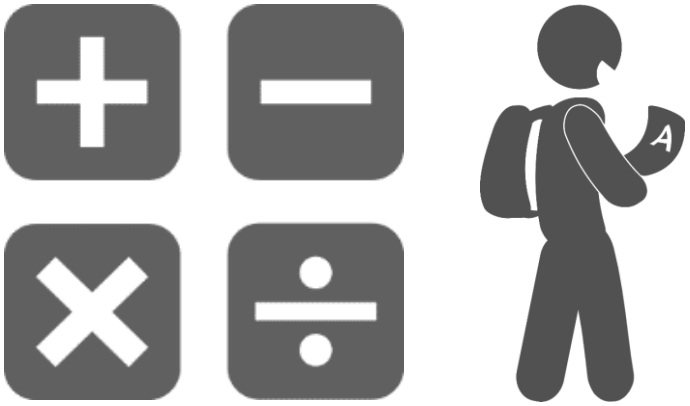

Mastery Worksheets	MAT 1033

Test 3

- ☐ Division of Polynomials
- ☐ Factoring
- ☐ Solve Equations by Factoring
- ☐ Rational Expressions: Simplify, Multiply, Divide
- ☐ Rational Expressions: Add, Subtract
- ☐ Complex Fractions

Mastery Worksheet | **MAT 1033**

MY NAME IS:

Division of Polynomials

Test 3 Worksheet 9	Practice Session #		Date:	/ /

If the divisor has *two or more* terms, we use long division to divide the polynomials. The long division process used to divide polynomials is similar to the long division process for dividing whole numbers.

Let's get to work…

Divide. State the quotient, remainder, divisor and dividend.

1 $\left(2x^2+5x-7\right)\div\left(x-1\right)$

2 $\left(-24x^2-22x+7\right)\div\left(-4x+1\right)$

Divide. Write the solution in the form: Quotient $+\dfrac{\text{remainder}}{\text{divisor}}$.

3 $\left(8x^3-18x^2+11x-21\right)\div\left(2x-3\right)$

4 $\left(-10x^3+2x^2+23x+12\right)\div\left(5x+4\right)$

How do I feel?

☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…

Mastery Worksheet	MAT 1033

MY NAME IS:

Factoring

Test 3 Worksheet 10	Practice Session #		Date:	/ /

Use the method **Factor by Grouping** to factor a four-term polynomial.

Step 1: Factor out the GCF from all four terms
Note: For any factoring problem, always factor out the GCF from all terms first.
Step 2: Group the first two terms and the last two terms. Factor out the GCF from each group of terms.
Step 3: Factor out the common binomial factor.

Let's get to work…

Factor by grouping.

1 $xy-8yz+10x-80z$

2 $ab+11a-5b-55$

Factor $ax^2+bx+c,\ a=1$

To factor trinomials of the form $ax^2+bx+c,\ a=1$, find two numbers that multiply to c and add to b.

Note: For any factoring problem, always factor out the GCF from all terms first.

Factor.

3 $x^2+3x-54$

4 $3x^2-15x+18$

Factor $ax^2+bx+c,\ a\neq 1$

To factor trinomials of the form $ax^2+bx+c,\ a\neq 1$, use

1. the AC-Method; find two numbers whose product is *ac* and sum is *b* or
2. the Trial-and-Error Method

Note: For any factoring problem, always factor out the GCF from all terms first.

5 $2x^2-7x-15$

6 $6x^2+17x+12$

7 $12x^2-52x-40$

Factor a Difference of Squares

To factor a difference of squares, a^2-b^2, apply the formula $a^2-b^2=(a+b)(a-b)$.

Note: The *SUM* of squares is not factorable; a^2+b^2 is prime if *a* and *b* have no common factors.

Factor.

8 $16x^2-81$

9 $50-8a^2$

10 $16c^4-d^4$

11 $3x^2+27$

How do I feel?

☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…

Factor a Sum or Difference of Cubes

To factor a sum or difference of cubes, $a^3 \pm b^3$, apply the following formulas:

Sum of cubes: $a^3+b^3=(a+b)(a^2-ab+b^2)$ **Difference of cubes:** $a^3-b^3=(a-b)(a^2+ab+b^2)$

Factor.

12 $8x^3-27$

13 a^6+125

14 $24x^4-3xy^3$

15 $k^5+\frac{1}{8}k^2$

Factor a Sum or Difference of Cubes

To factor a perfect square trinomial, apply the following formulas:

$a^2+2ab+b^2=(a+b)^2$ $a^2-2ab+b^2=(a-b)^2$

16 $9x^2-12x+4$

17 $25x^2+20xy+4y^2$

How do I feel? ☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…

Factor the Polynomial completely.

18 $2m^2 - 18$

19 $10y^2 + 3y - 4$

20 $48y^3 + 81$

21 $cx^2 - cy^2 + dx^2 - dy^2$

22 $a^2 - 2a + 1 - 9$ [Hint: Group the first three terms]

23 $14a^2 + 14$

24 $8x^2y^2 - 10xy - 3$

How do I feel? ☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…

Mastery Worksheet	MAT 1033

MY NAME IS:

Solve Equations by Factoring

Test 3 Worksheet 11	Practice Session #		Date:	/ /

Quadratic Equation in One Variable: A quadratic equation is an equation that can be written in the form $ax^2+bx+c=0$, where *a*, *b*, and *c* are real numbers and $a \neq 0$.

To Solve a Quadratic Equation by Factoring:

Step 1: Write the equation in the form $ax^2+bx+c=0$.
Step 2: Factor the polynomial completely.
Step 3: Set each factor equal to zero and solve.

Let's get to work…

Solve.

1 $x^2-3x-18=0$

2 $8y^2-6=13y$

3 $16a^2=81$

4 $25x^2=50x$

5 $x(5x+18)=8$

6 $\frac{1}{4}x^2-x=\frac{21}{4}$

Solve Equations by Factoring

Some higher-degree polynomial equations may also be solved by factoring.

Solve.

7 $z^3 + 3z^2 - 4z - 12 = 0$

8 $4x^3 - 8x^2 - 12x = 0$

9 $x^3 = 16x$

How do I feel?

☐ Awesome! I Aced it!

Easy | Medium | Hard

☐ I need help with…

Mastery Worksheet | **MAT 1033**

MY NAME IS:

Rational Expressions: Simplify, Multiply, Divide

Test 3 Worksheet 12	Practice Session #		Date:	/ /

Simplifying Rational Expressions

Rational Expression: An expression in the form $\frac{p}{q}$, where p and q are polynomial expressions and $q \neq 0$.

Simplify a Rational Expression: **Step 1:** Factor the numerator and denominator.
Step 2: Cancel common factors between the numerator and denominator.
Note: The ratio of a number and its opposite is -1.

Let's get to work…

Simplify.

1 $\frac{2x^3y^9}{8x^7y^2}$

2 $\frac{6(x-2)^3(x+1)^2}{2(x-2)^4(x+1)^3}$

3 $\frac{4x^2-13x+3}{x^2-9}$

4 $\frac{4y^3+12y^2-y-3}{8y^3+1}$

5 $\frac{2x-6}{3x^2-x^3}$

6 $\frac{20-5x}{x^2-x-12}$

Rational Expressions: Simplify, Multiply, Divide

Multiplying Rational Expressions

To Multiply Rational Expressions:

Step 1: Factor the numerator and denominator of each rational expression.
Step 2: Cancel common factors between the numerators and denominators.
Note: The ratio of a number and its opposite is .
Step 3: Multiply the numerators, and multiply the denominators.

Let's get to work…

Multiply.

7 $\frac{3y-6}{6y} \cdot \frac{y^2+3y+2}{y^2-4}$

8 $\frac{a^3+8}{a^3-5a} \cdot \frac{5-a^2}{a+2}$

9 $x\left(x^2-9\right) \cdot \frac{x+3}{x^2-3x}$

How do I feel?

☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…

Rational Expressions: Simplify, Multiply, Divide

Dividing Rational Expressions

To Divide Rational Expressions:
Step 1: Factor the numerator and denominator of each rational expression.
Step 2: Multiply the first fraction by the reciprocal of the second.

Let's get to work…

Divide.

10 $\dfrac{8x-4x^2}{xy-2y+3x-6} \div \dfrac{3x+6}{y+3}$

11 $\dfrac{x^2+3x-10}{2x} \div \dfrac{x^2-5x+6}{x^2-3x}$

Perform the indicated operations.

12 $\dfrac{2x^2-5x-3}{x^2-3x-4} \div \dfrac{x^2-9}{x-4} \cdot \dfrac{2x+6}{4x+2}$

13 $\dfrac{45}{3x+2} \cdot \left(9x^2-4\right) \div \dfrac{9x+6}{x}$

How do I feel?

☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…

Mastery Worksheet | **MAT 1033**

MY NAME IS:

Rational Expressions: Add, Subtract

Test 3 Worksheet 13	Practice Session #		Date:	/ /

Add/Subtract a Rational Expression:

Step 1: Factor each denominator
Step 2: Find the LCD
Step 3: Rewrite each fraction with the LCD
Step 4: Add/Subtract the numerators and write over the LCD
Step 5: Factor and simplify (if possible)

Let's get to work…

Perform the indicated operation and simplify.

1 $\dfrac{2x}{x^2-9}+\dfrac{6}{x^2-9}$

2 $\dfrac{5}{3x^2-2x-5}-\dfrac{3x}{3x^2-2x-5}$

3 $\dfrac{5-x}{x^2+2x-3}+\dfrac{3x+5}{x^2+4x+3}$

4 $\dfrac{4}{x+5}-\dfrac{3x}{x^2+3x-10}-\dfrac{3}{4-2x}$

How do I feel?

☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…

Mastery Worksheet	MAT 1033

MY NAME IS:

Complex Fractions

Test 3 Worksheet 15	Practice Session #		Date:	/ /

To simplify complex fractions.

1. Identify the LCD of the complex fraction.
2. Multiply numerator and denominator by LCD.
3. Simplify (if necessary).

Let's get to work…

Simplify the complex fraction.

1 $\dfrac{\dfrac{x-9}{7}}{\dfrac{x}{x+5}}$

2 $\dfrac{\dfrac{1}{x+6}}{\dfrac{3}{x^2-36}}$

How do I feel?

☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…

3 $\dfrac{\dfrac{5}{x-4}+\dfrac{1}{x}}{\dfrac{3}{x-4}+\dfrac{7}{x}}$

4 $\dfrac{\dfrac{5}{x^2-4}+\dfrac{1}{x-2}}{\dfrac{3}{x^2-4}+\dfrac{7}{x+2}}$

How do I feel?

☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…

5 $\dfrac{\dfrac{1}{x^2-3x+18}+\dfrac{1}{x^2-36}}{\dfrac{1}{x^2+12x+36}+\dfrac{1}{x^2-36}}$

6 $\dfrac{\dfrac{1}{x+h}-\dfrac{1}{x}}{h}$

How do I feel?

☐ Awesome! I Aced it! | Easy | Medium | Hard | ☐ I need help with…