

Simplify Algebraic Expressions – Distributive Property

| | |
|---|----------------------------------|
| Distributive Property: We use the distributive property to _____ | |
| Example A $-2(5x - 4y + 3)$ | Example B $4x(7x^2 - 6x + 1)$ |
| Practice A | Practice B |

Simplify Algebraic Expressions – Distribute and Combine

Order of operations tells us that _____ comes before _____

So we will always _____ first and then _____ last

Example A

$$4(3x - 7) - 7(2x + 1)$$

Example B

$$2(7x - 3) - (8x + 9)$$

Practice A

Practice B

Linear Equations – One Step Equations

Show that $x = -3$ is the solution to $4x + 5 = -7$

We solve by working _____, using the inverse or _____ operations!

Example A

$$x + 5 = 7$$

Example B

$$9 = x - 7$$

Example C

$$5x = 35$$

Example D

$$\frac{x}{4} = 3$$

Practice A

Practice B

Practice C

Practice D

Linear Equations – Two Step Equations

When solving we do Order of Operations in _____

First we will _____ and _____. Then we will _____ and _____

Example A

$$5 - 7x = 26$$

Example B

$$14 = -2 + 4x$$

Practice A

Practice B

Linear Equations - General

Move variables to one side by _____.

Sometimes we may have to _____ first.

Simplify by _____ and _____ on each side.

Example A

$$2x + 7 = -5x - 3$$

Example B

$$4(2x - 5) + 3 = 5(4x - 1) - 10x$$

Practice A

Practice B

Linear Equations – Fractions

Clear fractions by multiplying _____ by the _____

Important: Multiply _____ including _____

Example A

$$\frac{3}{4}x - \frac{1}{2} = \frac{5}{6}$$

Example B

$$\frac{3}{5}x - \frac{7}{10} = -4 + \frac{7}{15}x$$

Practice A

Practice B

Linear Equations – Distributing with Fractions

Important: Always _____ first and _____ second

Example A

$$\frac{1}{2} = \frac{3}{4} \left(2x - \frac{4}{9} \right)$$

Example B

$$\frac{2}{3}(x + 4) = 5 \left(\frac{5}{6}x - \frac{7}{15} \right)$$

Practice A

Practice B

Formulas – Two Step Formulas

Solving Formulas: Treat other variables like _____.

Final answer is an _____

Example: $3x = 15$ and $wx = y$

Example A

$$wx + b = y \text{ for } x$$

Example B

$$ab + cd = wx + y \text{ for } b$$

Practice A

Practice B

Formulas – Multi-Step Formulas

| | |
|---|---|
| Strategy: | |
| Example A $a(3x + b) = by \quad \text{for } x$ | Example B $3(a + 2b) + 5b = -2a + b \quad \text{for } a$ |
| Practice A | Practice B |

Formulas – Fractions

Clear fractions by _____

May have to _____ first!

Example A

$$\frac{5}{x} + 4a = \frac{b}{x} \quad \text{for } x$$

Example B

$$A = \frac{1}{2}h(b + c) \quad \text{for } b$$

Practice A

Practice B

Absolute Value – Two Solutions

What is inside the absolute value can be _____ or _____

This means we have _____

Example A

$$|2x - 5| = 7$$

Example B

$$|7 - 5x| = 17$$

Practice A

Practice B

Absolute Value – Isolate Absolute

Before we look at our two solutions, we must first _____

We do this by _____

Example A

$$5 + 2|3x - 4| = 11$$

Example B

$$-3 - 7|2 - 4x| = -32$$

Practice A

Practice B

Absolute Value – Two Absolutes

With two absolutes, we need _____

The first equation is _____

The second equation is _____

Example A

$$|2x - 6| = |4x + 8|$$

Example B

$$|3x - 5| = |7x + 2|$$

Practice A

Practice B

Word Problems – Number Problems

| | |
|--|--|
| <p>Translate:</p> <ul style="list-style-type: none">• Is/Were/Was/Will Be:• More than:• Subtracted from/Less Than: | |
| <p>Example A</p> <p>Five less than three times a number is nineteen. What is the number?</p> | <p>Example B</p> <p>Seven more than twice a number is six less than three times the same number. What is the number?</p> |
| <p>Practice A</p> | <p>Practice B</p> |

Word Problems – Consecutive Integers

| | |
|---|---|
| Consecutive Numbers: First: Second: Third: | |
| Example A Find three consecutive numbers whose sum is 543. | Example B Find four consecutive integers whose sum is -222 |
| Practice A | Practice B |

Word Problems – Consecutive Even/Odd

| | |
|--|---|
| Consecutive Even: First: Second: Third: | Consecutive Odd: First: Second: Third: |
| Example A Find three consecutive even integers whose sum is 84. | Example B Find four consecutive odd integers whose sum is 152. |
| Practice A | Practice B |

Word Problems – Triangles

| | |
|---|--|
| Angles of a triangle add to _____ | |
| <p>Example A</p> <p>Two angles of a triangle are the same measure. The third angle is 30 degrees less than the first. Find the three angles.</p> | <p>Example B</p> <p>The second angle of a triangle measures twice the first. The third angle is 30 degrees more than the second. Find the three angles.</p> |
| <p>Practice A</p> | <p>Practice B</p> |

Word Problems – Perimeter

| | |
|--|--|
| <p>Formula for Perimeter of a rectangle:</p> <p>Width is the _____ side</p> | |
| <p>Example A</p> <p>A rectangle is three times as long as it is wide. If the perimeter is 62 cm, what is the length?</p> | <p>Example B</p> <p>The width of a rectangle is 6 cm less than the length. If the perimeter is 52 cm, what is the width?</p> |
| <p>Practice A</p> | <p>Practice B</p> |

Age Problem – Variable Now

| | |
|---|--|
| <p>Table:</p> <p>Equation is always for the _____</p> | |
| <p>Example A</p> <p>Sue is five years younger than Brian. In seven years the sum of their ages will be 49 years. How old is each now?</p> | <p>Example B</p> <p>Maria is ten years older than Sonia. Eight years ago Maria was three times Sonia's age. How old is each now?</p> |
| <p>Practice A</p> | <p>Practice B</p> |

Age Problem – Sum Now

| | |
|---|---|
| <p>Consider: Sum of 8...</p> <p>When we have the sum now, for the first box we use _____ and the second we use _____</p> | |
| <p>Example A</p> <p>The sum of the ages of a man and his son is 82 years. How old is each if 11 years ago, the man was twice his son's age?</p> | <p>Example B</p> <p>The sum of the ages of a woman and her daughter is 38 years. How old is each if the woman will be triple her daughter's age in 9 years?</p> |
| <p>Practice A</p> | <p>Practice B</p> |

Age Problems – Variable Time

| | |
|---|--|
| If we don't know the time: | |
| <p>Example A</p> <p>A man is 23 years old. His sister is 11 years old. How many years ago was the man triple his sister's age?</p> | <p>Example B</p> <p>A woman is 11 years old. Her cousin is 32 years old. How many years until her cousin is double her age?</p> |
| <p>Practice A</p> | <p>Practice B</p> |

MPC 095 Module B: Graphing Linear Equations

Inequalities – Graphing

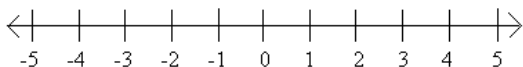
Inequalities:

- Less Than
- Less Than or Equal To
- Greater Than
- Greater Than or Equal To

Graphing on Number Line – Use _____ for less/greater than and use _____ when its “or equal to”

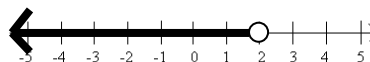
Example A

Graph $x \geq -3$



Example B

Give the inequality



Practice A

Practice B

Inequalities – Interval Notation

Interval notation:

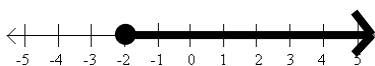
(,)

Use for less/greater than and use when its “or equal to”

∞ and $-\infty$ always use a

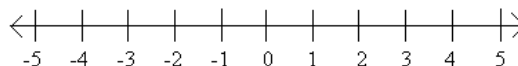
Example A

Give Interval Notation



Example B

Graph the interval $(-\infty, -1)$



Practice A

Practice B

Inequalities - Solving

Solving inequalities is just like _____

The only exception is if you _____ or _____ by a _____, you must

Example A

$$7 - 5x \leq 17$$

Example B

$$3(x + 8) + 2 > 5x - 20$$

Practice A

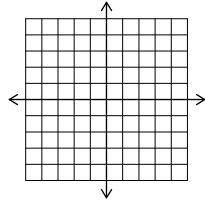
Practice B

Inequalities - Tripartite

| | |
|--|---------------------------------------|
| <p>Tripartite Inequalities:</p> <p>When solving _____</p> <p>When graphing _____</p> | |
| <p>Example A</p> $2 \leq 5x + 7 < 22$ | <p>Example B</p> $5 < 5 - 4x \leq 13$ |
| <p>Practice A</p> | <p>Practice B</p> |

Graphing and Slope – Points and Lines

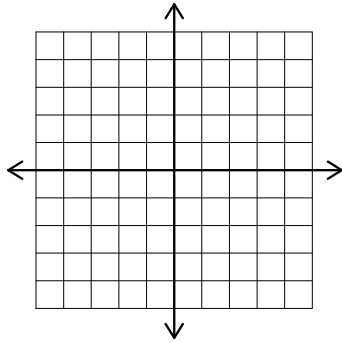
The coordinate plane:



Give _____ to a point going _____ then _____ as _____

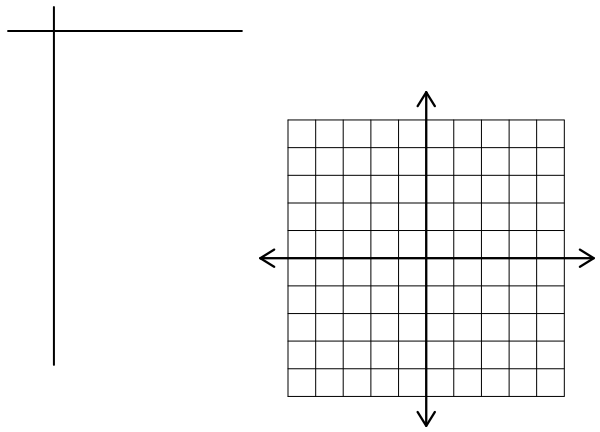
Example A

Graph the points
 $(-2,3)$, $(4, -1)$, $(-2, -4)$, $(0,3)$, and $(-1,0)$

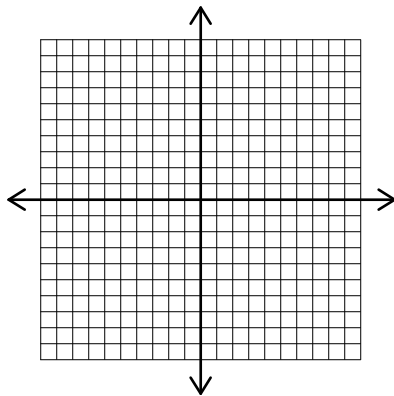


Example B

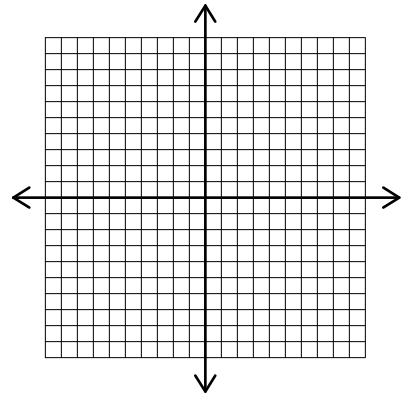
Graph the line: $y = 0.5x - 2$



Practice A



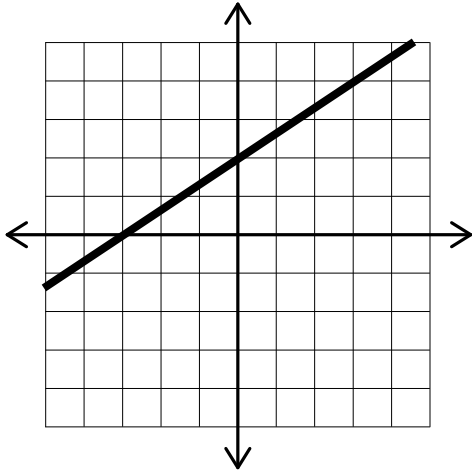
Practice B



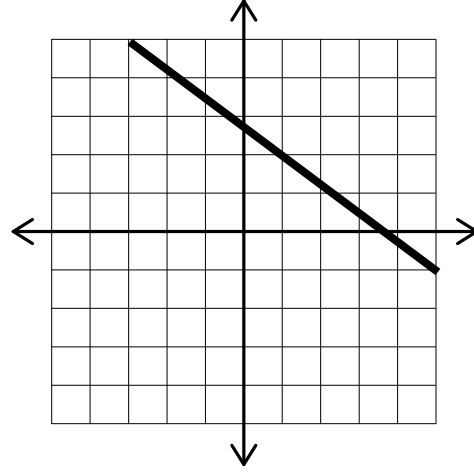
Graphing and Slope – Slope from a graph

Slope:

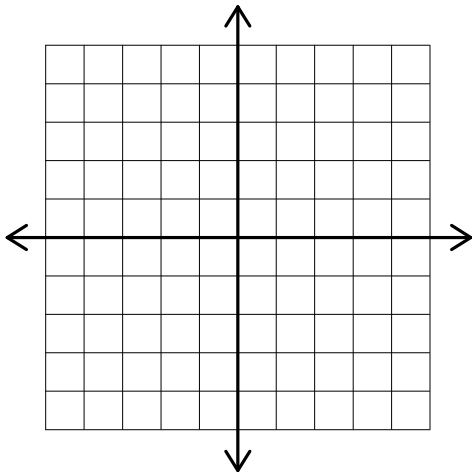
Example A



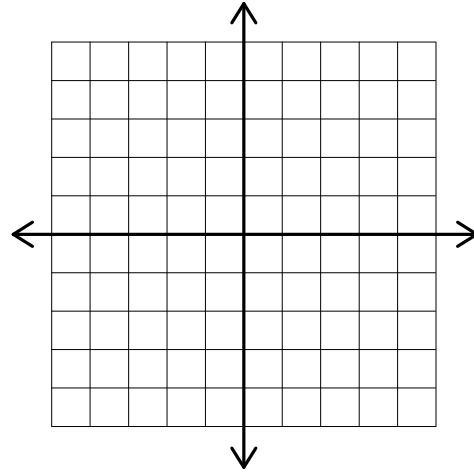
Example B



Practice A



Practice B

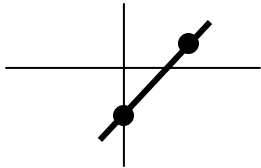


Graphing and Slope – Slope from two points

| | |
|--|---|
| Slope: | |
| Example A Find the slope between $(7,2)$ and $(11,4)$ | Example B Find the slope between $(-2,-5)$ and $(-17,4)$ |
| Practice A | Practice B |

Equations – Slope Intercept Equation

Slope-Intercept Equation:

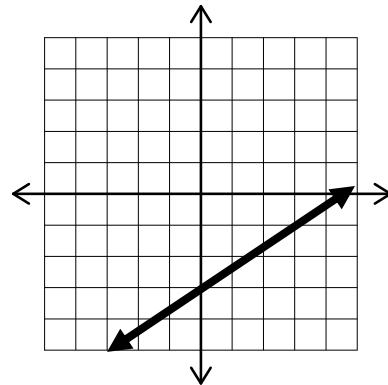


Example A

Give the equation with a slope of $-\frac{3}{4}$ and y-intercept of 2

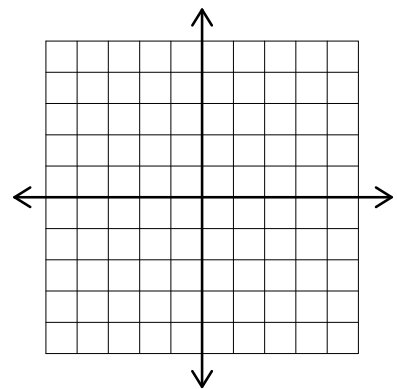
Example B

Give the equation of the graph



Practice A

Practice B



Equations – Put in Intercept Form

We may have to put an equation in intercept form.

To do this we _____

Example A

Give the slope and y-intercept
 $5x + 8y = 17$

Example B

Give the slope and y-intercept
 $y + 4 = \frac{2}{3}(x - 4)$

Practice A

Practice B

Equations - Graph

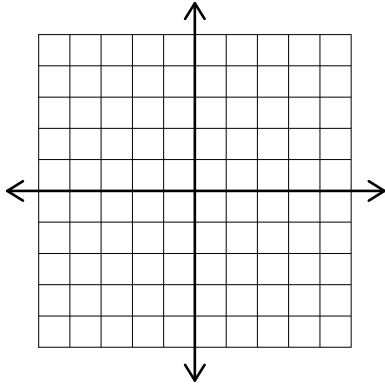
We can graph an equation by identifying the _____ and _____

Start at the _____ and use the _____ to change

Remember slope is _____ over _____

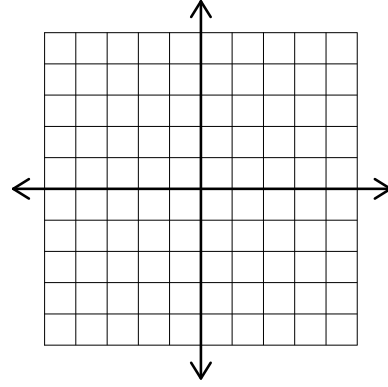
Example A

$$\text{Graph } y = -\frac{3}{4}x + 2$$

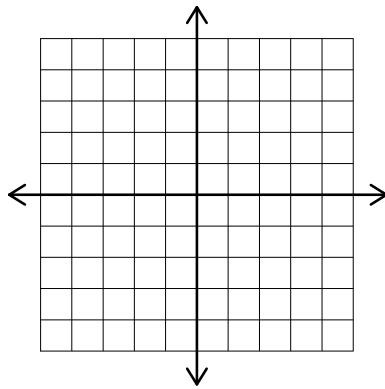


Example B

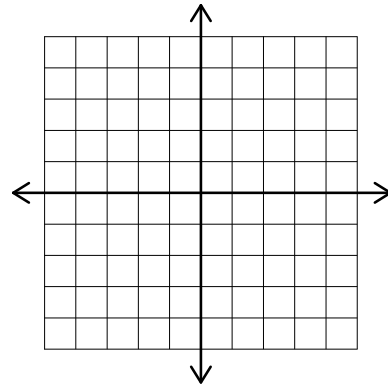
$$\text{Graph } 3x - 2y = 2$$



Practice A



Practice B



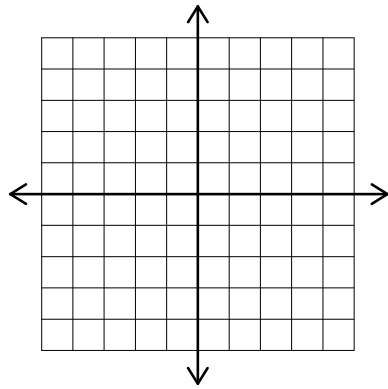
Equations – Vertical/Horizontal

Vertical Lines are always _____ equals the _____

Horizontal Lines are always _____ equals the _____

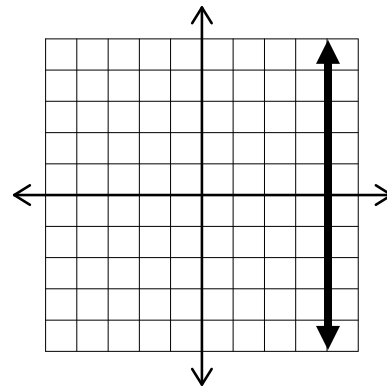
Example A

Graph $y = -2$

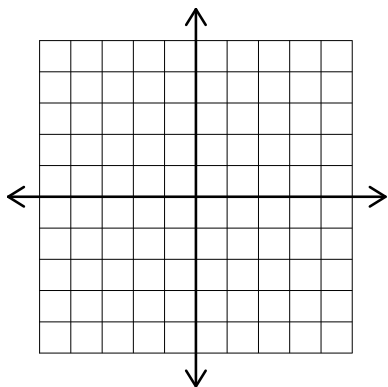


Example B

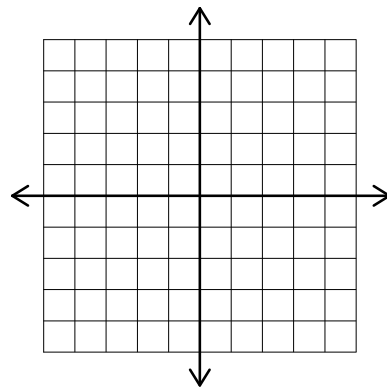
Find the equation



Practice A

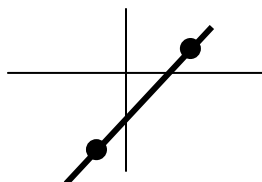


Practice B



Equations – Point Slope

Point Slope Equation:



Example A

Give the equation of the line that passes through $(-3, 5)$ and has a slope of $-\frac{2}{3}$

Example B

Give the equation of the line that passes through $(6, -2)$ and has a slope of 4. Give your final answer in slope-intercept form.

Practice A

Practice B

Equations – Given Two Points

To find the equation of a line you must have the _____

Recall the formula for slope:

Example A

Find the equation of the line through $(-3, -5)$ and $(2,5)$.

Example B

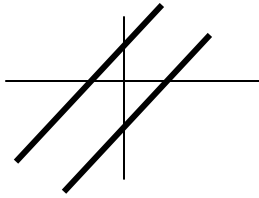
Find the equation of the line through $(1, -4)$ and $(3,5)$. Give answer in slope-intercept form.

Practice A

Practice B

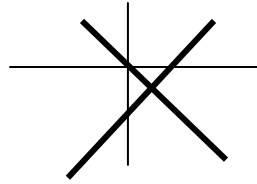
Parallel and Perpendicular - Slope

Parallel Lines:



Slope:

Perpendicular Lines:



Slope:

Example A

One line goes through $(5,2)$ and $(7,5)$. Another line goes through $(-2,-6)$ and $(0,-3)$. Are the lines parallel, perpendicular, or neither?

Example B

One line goes through $(-4,1)$ and $(-1,3)$. Another line goes through $(2,-1)$ and $(6,-7)$. Are the lines parallel, perpendicular, or neither?

Practice A

Practice B

Parallel and Perpendicular - Equations

Parallel lines have the _____ slope, Perpendicular lines have _____ slopes

Once we know the slope and a point we can use the formula:

Example A

Find the equation of the line parallel to the line $2x - 5y = 3$ that goes through the point $(5,3)$

Example B

Find the equation of the line perpendicular to line $3x + 2y = 5$ that goes through the point $(-3, -4)$

Practice A

Practice B

Distance – Opposite Directions

| | |
|--|--|
| <p>The distance Table:</p> <p>Opposite Directions:</p> | |
| <p>Example A</p> <p>Brian and Jennifer both leave the convention at the same time traveling in opposite directions. Brian drove 35 mph and Jennifer drove 50 mph. After how much time were they 340 miles apart?</p> | <p>Example B</p> <p>Maria and Tristan are 126 miles apart biking towards each other. If Maria bikes 6 mph faster than Tristan and they meet after 3 hours, how fast did each ride?</p> |
| <p>Practice A</p> | <p>Practice B</p> |

Distance – Catch Up

A head start: _____ the head start to his/her _____

Catch Up:

Example A

Raquel left the party traveling 5 mph. Four hours later Nick left to catch up with her, traveling 7 mph. How long will it take him to catch up?

Example B

Trey left on a trip traveling 20 mph. Julian left 2 hours later, traveling in the same direction at 30 mph. After how many hours does Julian pass Trey?

Practice A

Practice B

Distance – Total Time

| | |
|---|---|
| <p>Consider: Total time of 8...</p> | |
| <p>When we have a total time, for the first box we use _____ and the second we use _____</p> | |
| <p>Example A</p> <p>Lupe rode into the forest at 10 mph, turned around and returned by the same route traveling 15 mph. If her trip took 5 hours, how long did she travel at each rate?</p> | <p>Example B</p> <p>Ian went on a 230 mile trip. He started driving 45 mph. However, due to construction on the second leg of the trip, he had to slow down to 25 mph. If the trip took 6 hours, how long did he drive at each speed?</p> |
| <p>Practice A</p> | <p>Practice B</p> |

MPC 095 Module C: Polynomials

Exponents – Product Rule

$$a^3 \cdot a^2 =$$

$$\text{Product Rule: } a^m \cdot a^n =$$

Example A

$$(2x^3)(4x^2)(-3x)$$

Example B

$$(5a^3b^7)(2a^9b^2c^4)$$

Practice A

Practice B

Exponents – Quotient Rule

$$\frac{a^5}{a^3} =$$

Quotient Rule: $\frac{a^m}{a^n} =$

Example A

$$\frac{a^7b^2}{a^3b}$$

Example B

$$\frac{8m^7n^4}{6m^5n}$$

Practice A

Practice B

Exponents – Power Rules

$$(ab)^3 =$$

$$\text{Power of a Product: } (ab)^m =$$

$$\left(\frac{a}{b}\right)^3 =$$

$$\text{Power of a Quotient: } \left(\frac{a}{b}\right)^m =$$

$$(a^2)^3 =$$

$$\text{Power of a Power: } (a^m)^n =$$

Example A

$$(5a^4b)^3$$

Example B

$$\left(\frac{5m^3}{9n^4}\right)^2$$

Practice A

Practice B

Exponents - Zero

$$\frac{a^3}{a^3} =$$

Zero Power Rule: $a^0 =$

Example A

$$(5x^3yz^5)^0$$

Example B

$$(3x^2y^0)(5x^0y^4)$$

Practice A

Practice B

Exponents – Negative Exponents

$$\frac{a^3}{a^5} =$$

Negative Exponent Rules: $a^{-m} =$ $\frac{1}{a^{-m}} =$ $\left(\frac{a}{b}\right)^{-m} =$

Example A

$$\frac{7x^{-5}}{3^{-1}yz^{-4}}$$

Example B

$$\frac{2}{5a^{-4}}$$

Practice A

Practice B

Exponents - Properties

$$a^m a^n =$$

$$\frac{a^m}{a^n} =$$

$$(ab)^m =$$

$$\left(\frac{a}{b}\right)^m =$$

$$(a^m)^n =$$

$$a^0 =$$

$$a^{-m} =$$

$$\frac{1}{a^{-m}} =$$

$$\left(\frac{a}{b}\right)^{-m} =$$

To simplify:

Example A

$$(4x^5y^2z)^2(2x^4y^{-2}z^3)^4$$

Example B

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

Practice A

Practice B

Scientific Notation - Convert

| | |
|--|--|
| $a \times 10^b$ <ul style="list-style-type: none"> • a • b • b positive • b negative | |
| <p>Example A</p> <p>Convert to Standard Notation</p> <p>5.23×10^5</p> | <p>Example B</p> <p>Convert to Standard Notation</p> <p>4.25×10^{-4}</p> |
| <p>Example C</p> <p>Convert to Scientific Notation</p> <p>8150000</p> | <p>Example C</p> <p>Convert to Scientific Notation</p> <p>0.00000245</p> |
| <p>Practice A</p> | <p>Practice B</p> |
| <p>Practice C</p> | <p>Practice D</p> |

Scientific Notation – Close to Scientific

| | |
|-------------------------------------|-----------------------------------|
| Put number _____ | |
| Then use _____ on the 10's | |
| Example A 523.6×10^{-8} | Example B 0.0032×10^5 |
| Practice A | Practice B |

Scientific Notation – Multiply/Divide

| | |
|--|--|
| Multiply/Divide the _____ | |
| Use _____ on the 10's | |
| Example A $(3.4 \times 10^5)(2.7 \times 10^{-2})$ | Example B $\frac{5.32 \times 10^4}{1.9 \times 10^{-3}}$ |
| Practice A | Practice B |

Scientific Notation – Multiply/Divide where answer not scientific

| | |
|--|--|
| If your final answer is not in scientific notation _____ | |
| Example A $(6.7 \times 10^{-6})(5.2 \times 10^{-3})$ | Example B $\frac{2.352 \times 10^{-6}}{8.4 \times 10^{-2}}$ |
| Practice A | Practice B |

Polynomials - Evaluate

| | |
|---|--|
| <p>Term:</p> <p>Monomial:</p> <p>Binomial:</p> <p>Trinomial:</p> <p>Polynomial:</p> | |
| <p>Example A</p> <p>$5x^2 - 2x + 6$ when $x = -2$</p> | <p>Example B</p> <p>$-x^2 + 2x - 7$ when $x = 4$</p> |
| <p>Practice A</p> | <p>Practice B</p> |

Polynomials – Add/Subtract

| | |
|--|--|
| <p>To add polynomials:</p> <p>To subtract polynomials:</p> | |
| <p>Example A</p> $(5x^2 - 7x + 9) + (2x^2 + 5x - 14)$ | <p>Example B</p> $(3x^3 - 4x + 7) - (8x^3 + 9x - 2)$ |
| <p>Practice A</p> | <p>Practice B</p> |

Polynomials – Multiply by Monomials

| | |
|---------------------------------------|-------------------------------------|
| To multiply a monomial by polynomial: | |
| Example A $5x^2(6x^2 - 2x + 5)$ | Example B $-3x^4(6x^3 + 2x - 7)$ |
| Practice A | Practice B |

Polynomials – Multiply by Binomials

To multiply a binomial by a binomial:

This process is often called _____ which stands for _____

Example A

$$(4x - 2)(5x + 1)$$

Example B

$$(3x - 7)(2x - 8)$$

Practice A

Practice B

Polynomials – Multiply by Trinomials

| | |
|--|---|
| Multiplying trinomials is just like _____ we just have _____ | |
| Example A $(2x - 4)(3x^2 - 5x + 1)$ | Example B $(2x^2 - 6x + 1)(4x^2 - 2x - 6)$ |
| Practice A | Practice B |

Polynomials – Multiply Monomials and Binomials

| | |
|--|----------------------------------|
| Multiply _____ first, then _____ the _____ | |
| Example A $4(2x - 4)(3x + 1)$ | Example B $3x(x - 6)(2x + 5)$ |
| Practice A | Practice B |

Polynomials – Sum and Difference

$$(a + b)(a - b) =$$

Sum and Difference Shortcut:

Example A

$$(x + 5)(x - 5)$$

Example B

$$(6x - 2)(6x + 2)$$

Practice A

Practice B

Polynomials – Perfect Square

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

Perfect Square Shortcut:

Example A

$$(x - 4)^2$$

Example B

$$(2x + 7)^2$$

Practice A

Practice B

Division – By Monomials

Long Division Review:

$$\overline{5 \over 2632}$$

Example A

$$\frac{3x^5 + 18x^4 - 9x^3}{3x^2}$$

Example B

$$\frac{15a^6 - 25a^5 + 5a^4}{5a^4}$$

Practice A

Practice B

Division – By Polynomials

On division step, only focus on the _____

Example A

$$\frac{x^3 - 2x^2 - 15x + 30}{x + 4}$$

Example B

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

Practice A

Practice B

Division – Missing Terms

The exponents MUST _____

If one is missing we will add _____

Example A

$$\frac{3x^3 - 50x + 4}{x - 4}$$

Example B

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

Practice A

Practice B

MPC 095 Module D: Factoring

GCF and Grouping – Find the GCF

Greatest Common Factor:

On variables we use _____

Example A

Find the Common Factor

$$15a^4 + 10a^2 - 25a^5$$

Example B

Find the Common Factor

$$4a^4b^7 - 12a^2b^6 + 20ab^9$$

Practice A

Practice B

GCF and Grouping – Factor GCF

$$a(b + c) =$$

Put _____ in front, and divide. What is left goes in the _____

Example A

$$9x^4 - 12x^3 + 6x^2$$

Example B

$$21a^4b^5 - 14a^3b^7 + 7a^2b^4$$

Practice A

Practice B

GCF and Grouping – Binomial GCF

| | |
|--|---------------------------------------|
| GCF can be a _____ | |
| Example A $5x(2y - 7) + 6y(2y - 7)$ | Example B $3x(2x + 1) - 7(2x + 1)$ |
| Practice A | Practice B |

GCF and Grouping - Grouping

| | |
|--|------------------------------------|
| Grouping: GCF of the _____ and _____ then factor out _____ (if it matches!) | |
| Example A $15xy + 10y - 18x - 12$ | Example B $6x^2 + 3xy + 2x + y$ |
| Practice A | Practice B |

GCF and Grouping – Change Order

| | |
|---------------------------------------|------------------------------------|
| If binomials don't match: | |
| Example A $12a^2 - 7b + 3ab - 28a$ | Example B $6xy - 20 + 8x - 15y$ |
| Practice A | Practice B |

Trinomials – $a \neq 1$

$$ax^2 + bx + c$$

AC Method: Find a pair of numbers that multiply to _____ and add to _____

Using FOIL, these numbers come from __ and __

Example A

$$3x^2 + 11x + 10$$

Example B

$$12x^2 + 16xy - 3y^2$$

Practice A

Practice B

Trinomials – $a \neq 1$ with GCF

| | |
|--------------------------------------|--|
| Always factor the _____ first! | |
| Example A $18x^4 - 21x^3 - 15x^2$ | Example B $16x^3 + 28x^2y - 30xy^2$ |
| Practice A | Practice B |

Trinomials – $a = 1$

If there is a _____ in front of x^2 , the ac method gives us _____

Example A

$$x^2 - 2x - 8$$

Example B

$$x^2 + 7xy - 8y^2$$

Practice A

Practice B

Trinomials – $a = 1$ with GCF

| | |
|--------------------------------|--|
| Always do the _____ first!! | |
| Example A $7x^2 + 21x - 70$ | Example B $4x^4y + 36x^3y^2 + 80x^2y^3$ |
| Practice A | Practice B |

Special Products – Difference of Squares

$$(a + b)(a - b) =$$

Difference of Squares:

Example A

$$a^2 - 81$$

Example B

$$49x^2 - 25y^2$$

Practice A

Practice B

Special Products – Sum of Squares

| | |
|---|------------------------------|
| Factor: $a^2 + b^2$ Sum of Squares is always _____ | |
| Example A $x^2 + 9$ | Example B $16a^2 + 25b^2$ |
| Practice A | Practice B |

Special Products – Difference of 4th Powers

The square root of x^4 is _____

With fourth powers we can use _____ twice!

Example A

$$a^4 - 16$$

Example B

$$81x^4 - 256$$

Practice A

Practice B

Special Products – Perfect Squares

| | |
|---|------------------------------------|
| Using the ac method if the numbers _____ then it factors to _____ | |
| Example A $x^2 - 10x + 25$ | Example B $9x^2 + 30xy + 25y^2$ |
| Practice A | Practice B |

Special Products – Cubes

| | |
|---------------------------------------|-----------------------------|
| Sum of Cubes: Difference of Cubes: | |
| Example A $m^3 + 125$ | Example B $8a^3 - 27y^3$ |
| Practice A | Practice B |

Special Products - GCF

| | |
|---------------------------------|-----------------------------------|
| Always factor the _____ first!! | |
| Example A $8x^3 - 18x$ | Example B $2x^2y - 12xy + 18y$ |
| Practice A | Practice B |

Solve by Factoring – Zero Product Property

Zero Product Rule:

To solve we set each _____ equal to _____

Example A

$$(5x - 1)(2x + 5) = 0$$

Example B

$$2x(x - 6)(2x + 3) = 0$$

Practice A

Practice B

Solve by Factoring – Need to Factor

If we have x^2 and x in an equation, we need to _____ before we _____

Example A

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

Example B

$$3x^2 + x - 4 = 0$$

Practice A

Practice B

Solve by Factoring – Equal to Zero

Before we factor, the equation must equal _____.

To make factoring easier, we want the _____ to be _____.

Example A

$$5x^2 = 2x + 16$$

Example B

$$-2x^2 = x - 3$$

Practice A

Practice B

Solve by Factoring - Simplify

Before we make the equation equal zero, we may have to _____ first.

Example A

$$2x(x + 4) = 3x - 3$$

Example B

$$(2x - 3)(3x + 1) = -8x - 1$$

Practice A

Practice B

MPC 095 Module E: Rational Expressions

Reduce - Evaluate

Rational Expressions: Quotient of two _____

Example A

$$\frac{x^2 - 2x - 8}{x - 4} \text{ when } x = -4$$

Example B

$$\frac{x^2 - x - 6}{x^2 + x - 12} \text{ when } x = 2$$

Practice A

Practice B

Reduce – Reduce Fractions

To reduce fractions we _____ common _____

Example A

$$\frac{24}{15}$$

Example B

$$\frac{48}{18}$$

Practice A

Practice B

Reduce - Monomials

Quotient Rule of Exponents: $\frac{a^m}{a^n} =$

Example A

$$\frac{16x^5}{12x^9}$$

Example B

$$\frac{15a^3b^2}{25ab^5}$$

Practice A

Practice B

Reduce - Polynomials

To reduce we _____ common _____

This means we must first _____

Example A

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

Example B

$$\frac{9x^2 - 30x + 25}{9x^2 - 25}$$

Practice A

Practice B

Multiply and Divide - Fractions

First _____ common _____

Then multiply _____

Division is the same, with one extra step at the start: _____ by the _____

Example A

$$\frac{6}{35} \cdot \frac{21}{10}$$

Example B

$$\frac{5}{8} \div \frac{10}{4}$$

Practice A

Practice B

Multiply and Divide - Monomials

With monomials we can use _____

$$a^m \cdot a^n =$$

$$\frac{a^m}{a^n} =$$

Example A

$$\frac{6x^2y^5}{5x^3} \cdot \frac{10x^4}{3x^2y^7}$$

Example B

$$\frac{4a^5b}{9a^4} \div \frac{6ab^4}{12b^2}$$

Practice A

Practice B

Multiply and Divide - Polynomials

To divide out factors, we must first _____

Example A

$$\frac{x^2 + 3x + 2}{4x - 12} \cdot \frac{x^2 - 5x + 6}{x^2 - 4}$$

Example B

$$\frac{3x^2 + 5x - 2}{x^2 + 3x + 2} \div \frac{6x^2 + x - 1}{x^2 - 3x - 4}$$

Practice A

Practice B

Multiply and Divide – Both at Once

To divide:

Be sure to _____ before _____

Example A

$$\frac{x^2 + 3x - 10}{x^2 + 6x + 5} \cdot \frac{2x^2 - x - 3}{2x^2 + x - 6} \div \frac{8x + 20}{6x + 15}$$

Example B

$$\frac{x^2 - 1}{x^2 - x - 6} \cdot \frac{2x^2 - x - 15}{3x^2 - x - 4} \div \frac{2x^2 + 3x - 5}{3x^2 + 2x - 8}$$

Practice A

Practice B

LCD - Numbers

Prime Factorization:

To find the LCD use _____ factors with _____ exponents.

Example A

20 and 36

Example B

18, 54 and 81

Practice A

Practice B

LCD - Monomials

| | |
|--|-----------------------------------|
| Use _____ factors with _____ exponents | |
| Example A $5x^3y^2$ and $4x^2y^5$ | Example B $7ab^2c$ and $3a^3b$ |
| Practice A | Practice B |

LCD - Polynomials

Use _____ factors with _____ exponents

This means we must first _____

Example A

$$x^2 + 3x - 18 \text{ and } x^2 + 4x - 21$$

Example B

$$x^2 - 10x + 25 \text{ and } x^2 - x - 20$$

Practice A

Practice B

Add and Subtract - Fractions

To add or subtract we _____ the denominators by _____ by the missing
_____.

Example A

$$\frac{5}{20} + \frac{7}{15}$$

Example B

$$\frac{8}{14} - \frac{3}{10}$$

Practice A

Practice B

Add and Subtract – Common Denominator

Add the _____ and keep the _____

When subtracting we will first _____ the negative

Don't forget to _____

Example A

$$\frac{x^2 + 4x}{x^2 - 2x - 15} + \frac{x + 6}{x^2 - 2x - 15}$$

Example B

$$\frac{x^2 + 2x}{2x^2 - 9x - 5} - \frac{6x + 5}{2x^2 - 9x - 5}$$

Practice A

Practice B

Add and Subtract – Different Denominators

To add or subtract we _____ the denominators by _____ by the missing _____.

This means we may have to _____ to find the LCD!

Example A

$$\frac{2x}{x^2 - 9} + \frac{5}{x^2 + x - 6}$$

Example B

$$\frac{2x + 7}{x^2 - 2x - 3} - \frac{3x - 2}{x^2 + 6x + 5}$$

Practice A

Practice B

Dimensional Analysis – Convert Single Unit

Multiply by ___ and value does not change

1 =

Ask questions:

- 1.
- 2.
- 3.

Example A

5 feet to meters

Example B

3 miles to yards

Practice A

Practice B

Dimensional Analysis – Convert Two Units

| | |
|---|--|
| <p>“Per” is the _____</p> <p>Clear _____ unit at a time!</p> | |
| <p>Example A</p> <p>100 feet per second to miles per hour</p> | <p>Example B</p> <p>25 miles per hour to kilometers per minute</p> |
| <p>Practice A</p> | <p>Practice B</p> |