Week 1 Task List

This week we will cover Sections 1.1 – 1.4 in your e-book. Work through each of the following tasks, carefully filling in the following pages in your notebook.

Polya Time

☐ My time requirement for this week is: _____ minutes

Section 1.1 Linear Equations

☐ Work through Section 1.1 TTK
☐ Work through Objective 1 then do problems #1-3
☐ Work through Objective 2 then do problems #4-5
☐ Work through Objective 3 then do problems #6-8
☐ Work through Objective 4 then do problems #9-11
☐ Work through Objective 5 then do problems #12-15

Section 1.3 Complex Numbers

☐ Work through Section 1.3 TTK
☐ Work through Objective 1 then do problems #16-17
☐ Work through Objective 2 then do problems #18-19
☐ Work through Objective 3 then do problems #20-22
☐ Work through Objective 4 then do problems #23-25
☐ Work through Objective 5 then do problems #26-27

Section 1.4 Quadratic Equations

☐ Work through Section 1.4 TTK
☐ Work through Objective 1 then do problems #28-31
☐ Work through Objective 2 then do problems #32-33
☐ Work through Objective 3 then do problems #34-37
☐ Work through Objective 4 then do problems #38-40
☐ Work through Objective 5 then do problems #41-42

☐ Complete Notebook Quiz Policy Question #43

☐ **Now Complete Quiz 1**

Section 1.1 Linear Equations

1.1 Things To Know

1. Factoring Trinomials with a Leading Coefficient Equal to 1

Can you factor the polynomial $b^2 - 9b + 14$? Try working through a "You Try It" problem or refer to section R.5 or watch the video.

2. Factoring Trinomials with a Leading Coefficient Not Equal to 1.

Can you factor the polynomial $15x^2 - 17x - 4$? Try working through a "You Try It" problem or refer to section R.5 or watch the video.

Section 1.1 Objective 2 Solving Linear Equations with Integer Coefficients

What does the term **coefficient** mean?

Work through Example 1: Solve $5(x-6)-2x=3-(x+1)$.

Work through Example 2: Solve $6-4(x+4)=8x-2(3x+5)$.

NOW WORK WEEK 1 HW EXERCISES #4-5

Section 1.1 Objective 4 Solving Linear Equations Involving Decimals

When encountering a linear equation involving decimals, how do you eliminate the decimals?

Work through the video that accompanies Example 4 and write your notes here:
Solve $0.1(y-2)+.03(y-4)=.02(10)$

NOW WORK WEEK 1 HW EXERCISES #9-11

Fill in the blanks below:

Because _____ often have _____ solutions, it is imperative to first determine _____ that make any _____ equal to _____. Any solution that makes the denominator equal to _____ must be _____.

Work through Example 7 and take notes here: Solve $\frac{12}{x^2+x-2} - \frac{x+3}{x-1} = \frac{1-x}{x+2}$

(What do you have to do BEFORE you find the lowest common denominator?)

NOW WORK WEEK 1 HW EXERCISES #12-15

Section 1.3 Objective 1 Simplifying Powers of i

Explain the cyclic nature of powers of i:

Work through Example 1 and take notes here:

Try this one on your own: Write the expression i^{53} as $i, -1, -i,$ or 1. You should verify that i^{53} is equivalent to i. You might want to try a "You Try It" problem now.

NOW WORK WEEK 1 HW EXERCISES #16-17

Section 1.3 Objective 3 Multiplying Complex Numbers

Fill in the blanks below:
When multiplying two complex numbers, treat the problem as if were the multiplication of two _____. Just remember that _____ = _____.

Work through the video that accompanies Example 3 and write your notes here.
Multiply $(4-3i)(7+5i)$

Example 4: Simplify $(\sqrt{3}-5i)^2$. Work through the video that accompanies Example 4 and write your notes here:

NOW WORK WEEK 1 HW EXERCISES #20-22

Section 1.3 Objective 4 Finding the Quotient of Complex Numbers

Watch the video, work through Example 6 and take notes here: Write the quotient in the form: $a + bi = \frac{1 - 3i}{5 - 2i}$

Try this one on your own: Divide and simplify $\frac{3-7i}{2+i}$ and write your answer in the form $a + bi$. You should verify that $\frac{3-7i}{2+i}$ is equivalent to $-\frac{1}{5} - \frac{17}{5}i$. You might want to try a "You Try It" problem now.

NOW WORK WEEK 1 HW EXERCISES #23-25

Section 1.4 Quadratic Equations

1.4 Things To Know

Make sure that you spend some time convincing yourself that you understand each of the following objectives. You may want to do at least one "You Try It" problem for each objective before starting this section.

1. Simplifying Radicals
2. Simplifying Radicals with Negative Radicands
3. Factoring Trinomials with a Leading Coefficient Equal to 1
4. Factoring Trinomials with a Leading Coefficient Not Equal to 1.

Section 1.4 Objective 2 Solving Quadratic Equations Using the Square Root Property
Watch the video located just under Objective 2 and take notes on this page:

What is the **square root property** and when can we use it when solving quadratic equations?

Work through Example 2 in your e-book (as seen in the video) and take notes here:

a) $x^2 - 16 = 0$ b) $2x^2 + 72 = 0$ c) $(x-1)^2 = 7$

Try this one on your own: Solve the following equation using the square root property $(x-1)^2 + 16 = 0$ and see if you can get an answer of $x = 1 \pm 4i$. You might want to try a "You Try It" problem now.

NOW WORK WEEK 1 HW EXERCISES #32-33

Write down the **5 steps needed to solve the equation $ax^2 + bx + c = 0$ by completing the square**.

1.

2.

3.

4.

5.

Work through Example 4. Be sure to use the 5 steps listed above.
Solve $3x^2 - 18x + 19 = 0$ by completing the square.

Section 1.4 Objective 4 Solving Quadratic Equations Using the Quadratic Formula

If you can solve the equation $ax^2 + bx + c = 0$, $a \neq 0$ by completing the square then you can derive the quadratic formula. **Work through the animation** that derives the quadratic formula by following the 5-step process for completing the square. Derive the quadratic formula by filling in the steps below:

Deriving the Quadratic Formula

(Write formulas AND descriptive words below.)

Start with the equation $ax^2 + bx + c = 0$, $a \neq 0$.

Step 1.

Step 2.

Step 3.

Step 4.

Step 5.

Section 1.4 Objective 5 Using the Discriminant to Determine the Type of Solutions of a Quadratic Equation

Watch the video located under Objective 5 and take notes here:

Work through Example 8 and take notes here: Use the discriminant to determine the number and nature of the solutions to each of the following quadratic equations:

a) $3x^2 + 2x + 2 = 0$ b) $4x^2 + 1 = 4x$.

NOW WORK WEEK 1 HW EXERCISES #41-42

NOW COMPLETE NOTEBOOK QUIZ POLICY QUESTION #43

YOU ARE NOW READY TO TRY WEEK 1 QUIZ. REMEMBER THAT YOU CAN TAKE THIS QUIZ UP TO 10 TIMES.

4. There are two types of quotients that you encountered when solving problems in which you simplify quotients with imaginary numbers. ***In a paragraph***, explain 1) what the two types of quotients are and 2) how you will simplify them.

5. There are several things to remember when solving quadratic equations. Look at the Week 1 Homework problems, or in your filled out notebook, and ***write a paragraph*** of the things that you needed to remember when you worked these problems.

6. ***Write a paragraph*** that you can use to explain to someone how to solve a quadratic equation by completing the square.

7. After answering these questions, what did you remember that you'd forgotten?

Week 2 Task List

This week we will cover Sections 1.5 – 1.7 in your e-book. Work through each of the following tasks, carefully filling in the following pages in your notebook.

Grade Check

☐ Fill out your Grade Calculation page

Polya Time

☐ My time requirement for this week is: _____ minutes

Prerequisite

☐ Earn at least a 20% on Practice Test 1

Section 1.5 Applications of Quadratic Equations

☐ Work through Section 1.5 TTK #3 then do problems #1-2
☐ Work through Section 1.5 TTK #4 then do problems #3-4
☐ Work through Section 1.5 TTK #5 then do problem #5
☐ Work through Objective 2 then do problems #6-7
☐ Work through Objective 3 then do problems #8-9

Section 1.6 Other Types of Equations

☐ Work through Section 1.6 TTK #1 then do problems #10-11
☐ Work through Section 1.6 TTK #2 then do problems #12-13
☐ Work through Section 1.6 TTK #3 then do problem #14
☐ Work through Section 1.6 TTK #4 then do problem #15-16
☐ Work through Objective 1 then do problems #17-19
☐ Work through Objective 2 then do problems #20-24
☐ Work through Objective 3 then do problems #25-28

Section 1.7 Linear Inequalities

☐ Work through Section 1.7 TTK #1 then do problems #29-31
☐ Work through Section 1.7 TTK #2 then do problems #32-33
☐ Work through Objective 1 then do problems #34-36
☐ Work through Objective 2 then do problems #37-39
☐ Work through Objective 3 then do problems #40-44
☐ Work through Objective 4 then do problems #45-47

☐ Complete Notebook Quiz Policy Question #48

☐ **Now Complete Quiz 2**

NBQ Week 2—Grade Calculation

Name_____

Student ID_____

Log into PolyaWeb to find your individual scores. Use these scores to fill out the tables below. Bring this completed grade sheet to class. It must be filled out completely and correctly at the beginning of class to receive credit. Ask a tutor if you need help finding your individual scores.

In Class Notebook Quizzes (NBQ)

Week	*Possible*	*Earned*
NBQ 0	4	
NBQ 1	4	
SUBTOTAL	**8**	

Polya Lab Attendance (PA)

Week	*Possible*	*Earned*
Week 1	4	
SUBTOTAL	**4**	

Homework (HW)

Homework	*Possible*	*Earned*
HW 1	10	
SUBTOTAL	**10**	

Quizzes

Quiz	*Possible*	*Earned*
Quiz 1	10	
SUBTOTAL	**10**	

Copy your subtotals here and find the grand total:

SUBTOTAL NBQ	
SUBTOTAL PA	
SUBTOTAL HW	
SUBTOTAL QUIZZES	
GRAND TOTAL	

Do not include extra credit.
Do not drop any scores.

Your current grade through week 1:

[ ] ÷ .32 [ ] %

Enter your Grand Total in the box

Round to the nearest tenth as needed

Section 1.5 Applications of Quadratic Equations

1.5 Things To Know

3. Solving Quadratic Equations by Factoring and the Zero Product Property (Section 1.4).

   How are your factoring skills? What does the **zero product property** say? Can you solve the equation $6x^2 - 7x - 3 = 0$ by factoring and by using the zero product property?

NOW WORK WEEK 2 HW EXERCISES #1-2

4. Solving Quadratic Equations by Completing the Square (Section 1.4)

   Explain how to solve the equation $3x^2 - 18x + 19 = 0$ by completing the square. (Watch the video!)

NOW WORK WEEK 2 HW EXERCISES #3-4

Section 1.5 Objective 3 Solving Geometric Applications

Work through the interactive video that accompanies Example 3 and write your notes here: The length of a rectangle is 6 in. less than four times the width. Find the dimensions of the rectangle if the area is 54 in^2.

Work through Example 4 taking notes here: Jimmy bought a new 40 in high-definition television. If the length of Jimmy's television is 8 in longer than the width, find the width of the television. (Remember the Pythagorean Theorem: $a^2 + b^2 = c^2$)

NOW WORK WEEK 2 HW EXERCISES #8-9

Note: You are not assigned problems from objectives 4 and 5!

1.6 Things To Know

3. Factoring Polynomials by Grouping (Section R.5)

When we encounter a polynomial with **4 terms** such as $2x^2 + 6xw - xy - 3wy$ it is a good idea to try to factor by grouping. Watch the video from this TTK objective to see how this polynomial is factored.

NOW WORK WEEK 2 HW EXERCISES #14

4. Solving Quadratic Equations by Factoring and the Zero Product Property (Section 1.4)

What does the zero product property say? Can you solve a quadratic equation by factoring? Try working through a "You Try It" problem.

NOW WORK WEEK 2 HW EXERCISES #15-16

Work through Example 2 and take notes here: Find all solutions of the equation
$2x^3 - x^2 + 8x - 4 = 0$

Hint for #18: $a^2 - b^2 = (a - b)(a + b)$ "Difference of Squares"

NOW WORK WEEK 2 HW EXERCISES #17-19

Section 1.6 Objective 2 Solving Equations That are Quadratic In Form (Disguised Quadratics)
What does it mean for an equation to be "quadratic in form"?

Work through the interactive video that accompanies Example 3 and solve each equation:

Example 3a: $2x^4 - 11x^2 + 12 = 0$

Section 1.6 Objective 3 Solving Equations Involving Radicals

Work through Example 4 taking notes here: Solve $\sqrt{x-1}-2=x-9$

As indicated in the e-Text, make sure that you ALWAYS isolate the radical prior to squaring both sides of an equation that involves a square root.

What is an **extraneous solution**?

Why is it important to check your solutions when solving equations involving radicals?

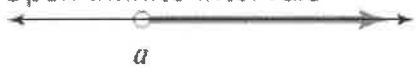
Section 1.7 Linear Inequalities

1.7 Things To Know

1. Describing Intervals of Real Numbers (Section R.1)

You must get familiar with **Interval Notation, Set Builder Notation, and Using a Number Line** to describe solutions. Click on Section R.1 to see the following summary table which describes 5 different types of intervals.

Table 1

Type of Interval and Graph	Interval Notation	Set-Builder Notation
Open interval 	(a, b)	$\{x \mid a < x < b\}$
Closed interval 	$[a, b]$	$\{x \mid a \leq x \leq b\}$
Half-open intervals  	$(a, b]$ $[a, b)$	$\{x \mid a < x \leq b\}$ $\{x \mid a \leq x < b\}$
Open infinite intervals  	(a, ∞) $(-\infty, b)$	$\{x \mid x > a\}$ $\{x \mid x < b\}$
Closed infinite intervals  	$[a, \infty)$ $(-\infty, b]$	$\{x \mid x \geq a\}$ $\{x \mid x \leq b\}$

Now go back to Section 1.7

1.7 Things To Know

2. Understanding the Intersection and Union of Sets (Section R.1)
   Watch the video to see how to find the intersection and union of intervals. Take notes on the following two examples that appear in this video:

   Example a) Find the intersection: $[0,\infty) \cap (-\infty,5]$

   Example b) Find the intersection: $\big((-\infty,-2) \cup (-2,\infty)\big) \cap [-4,\infty)$

NOW WORK WEEK 2 HW EXERCISES #32-33

Section 1.7 Objective 1 Solving Linear Inequalities

What is the definition of a **linear inequality**?

Be sure that you are familiar with the 6 properties of linear inequalities below:

Properties of Inequalities

Let a, b, and c be real numbers:

	Property	In Words	Example
1.	If $a < b$, then $a + c < b + c$	The same number may be added to both sides of an inequality.	$-3 < 7$ $-3 + 4 < 7 + 4$ $1 < 11$
2.	If $a < b$, then $a - c < b - c$	The same number may be subtracted from both sides of an inequality.	$9 \geq 2$ $9 - 6 \geq 2 - 6$ $3 \geq -4$
3.	For $c > 0$, if $a < b$, then $ac < bc$	Multiplying both sides of an inequality by a *positive* number *does not reverse the direction* of the inequality.	$3 > 2$ $(3)(5) > (2)(5)$ $15 > 10$
4.	For $c < 0$, if $a < b$, then $ac > bc$	Multiplying both sides of an inequality by a *negative* number *reverses the direction* of the inequality.	$3 > 2$ $(3)(-5) < (2)(-5)$ $-15 < -10$
5.	For $c > 0$, if $a < b$, then $\frac{a}{c} < \frac{b}{c}$	Dividing both sides of an inequality by a *positive* number *does not reverse the direction* of the inequality.	$6 > 4$ $\frac{6}{2} > \frac{4}{2}$ $3 > 2$
6.	For $c < 0$, if $a < b$, then $\frac{a}{c} > \frac{b}{c}$	Dividing both sides of an inequality by a *negative* number *reverses the direction* of the inequality.	$6 > 4$ $\frac{6}{-2} < \frac{4}{-2}$ $-3 < -2$

Section 1.7 Objective 2 Solving Three-Part Inequalities

Work through Example 3 taking notes here: Solve the inequality $-2 \leq \frac{2-4x}{3} < 5$. Graph the solution set on a number line, and write the solution in set-builder notation.

NOW WORK WEEK 2 HW EXERCISES #37-39

Section 1.7 Objective 3 Solving Compound Inequalities

What two words are seen in compound inequalities?

Work through Example 4 and take notes here: Solve $2x - 7 < -1$ and $3x + 5 \geq 3$. Graph the solution set, and write the solution in interval notation.

Section 1.7 Objective 4 Solving Linear Inequality Word Problems

Work through Example 7 and take notes here:

Suppose you rented a forklift to move a pallet with 70-lb blocks stacked on it. The forklift can carry a maximum of 2,500 lbs. If the pallet weighs 50-lb by itself with no blocks, how many blocks can be stacked on a pallet and lifted by the forklift?

Work through Example 8 and take notes here:

The perimeter of a rectangular fence is to be at least 80 feet and no more than 140 feet. If the width of the fence is 12 feet, what is the range of values for the length of the fence?

NOW WORK WEEK 2 HW EXERCISES #45-47

NOW COMPLETE NOTEBOOK QUIZ POLICY QUESTION #48

YOU ARE NOW READY TO TRY WEEK 2 QUIZ. REMEMBER THAT YOU CAN TAKE THIS QUIZ UP TO 10 TIMES.