Name:

Common Core Algebra II

Unit 3

Equations with Factoring and Complex Numbers

Mr. Schlansky

2026

Lesson 1: I can solve quadratic equations by factoring.
1) Bring everything to one side. Keep the leading coefficient positive.
2) Factor
3) Set each factor equal to zero

Lesson 2: I can solve radical equations by squaring both sides.
1) Isolate the radical
2) Square both sides
3) Solve equation
4) Check for extraneous solutions

*If you have a double radical, isolate one of the radicals and square both sides. You will have to use box method.

Lesson 3: I can solve fractional equations by multiplying by the LCD
1) Multiply by the LCD!
   To find LCD:
   Integers: Find least common multiple (smallest integer every integer goes into)
   Variables: Put all factors in all denominators together
2) Solve equation
3) Check for extraneous solutions

***Factor the denominators if necessary**
***Extraneous solutions are the solutions that do not check!**

Lesson 4: I can reduce negative radicals by separating into perfect squares and non perfect squares and using $i = \sqrt{-1}$.
Reducing Negative Radicals
1) Separate radical into two radicals: perfect squares and non-perfect square
2) Take the square root of the perfect square

* A negative inside a radical becomes an *i* and comes outside because $i = \sqrt{-1}$.

Lesson 5: I can solve quadratic equations using the quadratic formula.
Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

1) $ax^2 + bx + c = 0$
2) List a, b, and c values
3) Substitute values into quadratic formula
4) Type discriminant into the calculator (what is underneath the radical)
5) REDUCE THE RADICAL off to the side (If possible)
6) Reduce from all three terms (If possible)

*Separate into two fractions if there is an *i* involved.

Lesson 6: I can solve practice solving quadratic equations using the quadratic formula.
Calculator shortcut: Apps, PlySmlt2: 1: Polynomial Root Finder. Don't forget to click a+bi.
If you get a decimal, match the multiple choice answers to the appropriate decimal.

If it's not multiple choice, same notes as Lesson 5.

Lesson 7: I can solve quadratic equations using Isolate/Square Root Method

1) Isolate x^2
2) Take the square root of both sides

*Don't forget $\pm$
*Reduce the radical if necessary

Lesson 8: I can solve polynomial equations with imaginary/irrational solutions by factoring and using the quadratic formula and completing the square.
Polynomial Equations
1) Bring everything to one side. Keep the leading coefficient positive.
2) Factor (Refer to above section)
3) Set each factor equal to zero

Lesson 9: I can reduce powers of *i* by dividing the power by 4 and matching up the decimal with my table.

1) Divide the power by 4
2) Match the decimal up to the table

OR

1	.0
i	.25
-1	.50
$-i$	.75

Type it into the calculator and get an answer.
*If the power is above 100, just drop the 100s and use the 2 digit number

Lesson 10: I can perform operations with complex numbers using $i^2 = -1$.
Operations with Polynomials
Adding: Combine like terms
Subtracting: Keep, change, change
Keep the first polynomial
Change subtraction to addition
Change EVERY sign in the second polynomial
*From comes first

Multiplying Binomials: Box Method
$i^2 = -1$, $i^3 = -i$

Multiple Choice Strategy with Variables
If variables in the problems and answers:
10 STO $\rightarrow$ X, 15 STO $\rightarrow$ Y
Type in original problem, write down the value.
Type in each choice, write down the value.
If they match up, they are equivalent.
Check all four choices as more than one may be equivalent!

1. The expression $\frac{6x^3+17x^2+10x+2}{2x+3}$ equals

1) $3x^2+4x-1+\frac{5}{2x+3}$
3) $6x^2-x+13-\frac{37}{2x+3}$
2) $6x^2+8x-2+\frac{5}{2x+3}$
4) $3x^2+13x+\frac{49}{2}+\frac{151}{2x+3}$

2. The expression $\frac{4x^3+5x+10}{2x+3}$ is equivalent to

1) $2x^2+3x-7+\frac{31}{2x+3}$
3) $2x^2+2.5x+5+\frac{15}{2x+3}$
2) $2x^2-3x+7-\frac{11}{2x+3}$
4) $2x^2-2.5x-5-\frac{20}{2x+3}$

3. What is the completely factored form of $k^4-4k^2+8k^3-32k+12k^2-48$?

1) $(k-2)(k-2)(k+3)(k+4)$
3) $(k+2)(k-2)(k+3)(k+4)$
2) $(k-2)(k-2)(k+6)(k+2)$
4) $(k+2)(k-2)(k+6)(k+2)$

4. When factored completely, the expression $3x^3-5x^2-48x+80$ is equivalent to

1) $(x^2-16)(3x-5)$
3) $(x+4)(x-4)(3x-5)$
2) $(x^2+16)(3x-5)(3x+5)$
4) $(x+4)(x-4)(3x-5)(3x-5)$

5. Given i is the imaginary unit, $(2-yi)^2$ in simplest form is

1) $y^2-4yi+4$
3) $-y^2+4$
2) $-y^2-4yi+4$
4) y^2+4

6. The expression $(x+i)^2-(x-i)^2$ is equivalent to

1) 0
3) -2
2) $-2+4xi$
4) $4xi$

7. The expression $6xi^3(-4xi+5)$ is equivalent to

1) $2x-5i$
3) $-24x^2+30x-i$
2) $-24x^2-30xi$
4) $26x-24x^2i-5i$

Multiple Choice Strategy with Equations
-Store each potential answer (_____ STO $\rightarrow$ X)
-Type in left hand side, type in right hand side. If they match up, it is a solution.
*Be sure to check all potential answers as most equations have multiple answers

1. The solution set of the equation $\sqrt{x+3} = 3 - x$ is
1) $\{1\}$
2) $\{0\}$
3) $\{1, 6\}$
4) $\{2, 3\}$

2. What is the solution set for the equation $\sqrt{5x+29} = x+3$?
1) $\{4\}$
2) $\{-5\}$
3) $\{4, 5\}$
4) $\{-5, 4\}$

3. The solution set of $\sqrt{3x+16} = x+2$ is
1) $\{-3, 4\}$
2) $\{-4, 3\}$
3) $\{3\}$
4) $\{-4\}$

4. The solution set of the equation $\sqrt{2x-4} = x-2$ is
1) $\{-2, -4\}$
2) $\{2, 4\}$
3) $\{4\}$
4) $\{\ \}$

5. What is the solution set of the equation $\frac{30}{x^2-9} + 1 = \frac{5}{x-3}$?
1) $\{2, 3\}$
2) $\{2\}$
3) $\{3\}$
4) $\{\ \}$

Open Response Equations

1) Type in left hand side into Y1
2) Type in right hand side into Y2
3) Adjust window (if necessary)
4) 2nd Trace (Calc), 5: Intersect
5) The solution is the x value of the intersection

*You may want to divide both sides at the beginning to make the values smaller

1. Solve for all values of x: $\sqrt{x-5}+x=7$

2. What is the solution set for the equation $\sqrt{56-x}=x$?

3. What is the solution set for the equation $\sqrt{5x+29}=x+3$?

4. Solve algebraically for x: $\sqrt{x^2+x-1}+11x=7x+3$

5. What is the solution set of the equation $\frac{30}{x^2-9}+1=\frac{5}{x-3}$?

6. What is the solution set of the equation $\frac{3x+25}{x+7}-5=\frac{3}{x}$?

7. What is the solution, if any, of the equation $\frac{2}{x+3}-\frac{3}{4-x}=\frac{2x-2}{x^2-x-12}$?

8. Solve for x: $\frac{1}{x}-\frac{1}{3}=-\frac{1}{3x}$

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Solving Quadratic Equations by Factoring

1. $y^2-5y-6=0$

2. $x^2+4x=0$

3. $a^2-8a=20$

4. $3x^2=48$

5. $x^2-6x=-8$

6. $3x^2+3x-6=0$

7. $n^2=3n+18$

8. $2x^2+3x=5$

9. $x^2 - 6x = 2x + 20$

10. $x^2 + 2(x - 4) = 3x - 8$

11. $4(x^2 + 2x) = 8x + 64$

12. $4x^2 + 4x = 3$

13. $x^2 + 5x = -4(x + 5)$

14. $4x^2 = 25$

15. $3x^2 + 5x = 2x + 60$

16. $8m^2 + 20m = 12$

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Solving Radical Equations

Solve the following radical equations and CHECK each solution

1. $\sqrt{2x+1}+4=8$

2. $\sqrt{x-5}+x=7$

3. $\sqrt{56-x}=x$

4. $\sqrt{2x-7}+x=5$

5. $\sqrt{5x+29} = x+3$

6. $\sqrt{2x-4} = x-2$

7. $\sqrt{x^2+x-1} + 11x = 7x+3$

8. $3\sqrt{x} - 2x = -5$

9. $\sqrt{49-10x} + 5 = 2x$

10. $\sqrt{4x+1} = 11-x$

11. $\sqrt{x} - 1 = \sqrt{x - 10}$

12. $\sqrt{x} - 3 = \sqrt{x - 9}$

13. $\sqrt{9x} + 2 = \sqrt{7x + 18}$

14. $\sqrt{2x} - 3 = \sqrt{10x + 11}$

15. $\sqrt{5x} - \sqrt{9x - 9} = 1$

16. $\sqrt{9 - x} - \sqrt{2x} = 3$

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Fractional Equations

Solve the following fractional equations and list the solutions as well as the extraneous solutions

1. $\frac{1}{x}-\frac{1}{3}=-\frac{1}{3x}$

2. $\frac{5x}{2}=\frac{1}{x}+\frac{x}{4}$

3. $\frac{x+2}{x}+\frac{x}{3}=\frac{2x^2+6}{3x}$

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

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

6. $\frac{x}{x-1}=\frac{2}{x}+\frac{1}{x-1}$

7. $\frac{3x+25}{x+7} - 5 = \frac{3}{x}$

8. $\frac{8}{x+5} - \frac{3}{x} = 5$

9. $\frac{7}{2x} - \frac{2}{x+1} = \frac{1}{4}$

10. $\frac{2}{n^2} + \frac{3}{n} = \frac{4}{n^2}$

11. $\frac{x+3}{x-5} + \frac{6}{x+2} = \frac{6+10x}{(x-5)(x+2)}$

12. $\frac{\mathbf{30}}{x^2-\mathbf{9}} + \mathbf{1} = \frac{\mathbf{5}}{x-\mathbf{3}}$

13. $\frac{1}{x-2}+\frac{4}{x+5}=\frac{7}{x^2+3x-10}$

14. $\frac{x}{x+3}+\frac{2}{x-4}=\frac{2x+27}{x^2-x-12}$

15. $\frac{1}{x-6}+\frac{x}{x-2}=\frac{4}{x^2-8x+12}$

16. $\frac{4}{k^2-8k+12}=\frac{k}{k-2}+\frac{1}{k-6}$

17. $\frac{x}{x+2}+\frac{1}{x^2-4}=\frac{4}{x-2}$

18. $\frac{2}{x+3}-\frac{3}{4-x}=\frac{2x-2}{x^2-x-12}$

19. Markus is a long-distance walker. In one race, he walked 55 miles in t hours and in another race walked 65 miles in $t + 3$ hours. His rates are shown in the equations below.

$$r = \frac{55}{t} \quad r = \frac{65}{t+3}$$

Markus walked at an equivalent rate, r, for each race. Determine the number of hours that each of the two races took.

20. Sarah is fighting a sinus infection. Her doctor prescribed a nasal spray and an antibiotic to fight the infection. The active ingredients, in milligrams, remaining in the bloodstream from the nasal spray, $n(t)$, and the antibiotic, $a(t)$, are modeled in the functions below, where t is the time in hours since the medications were taken.

$$n(t) = \frac{t+1}{t+5} + \frac{18}{t^2 + 8t + 15}$$

$$a(t) = \frac{9}{t+3}$$

Determine which drug is made with a greater initial amount of active ingredient. Justify your answer. Sarah's doctor told her to take both drugs at the same time. Determine algebraically the number of hours after taking the medications when both medications will have the same amount of active ingredient remaining in her bloodstream.

21. To solve the equation $\frac{7}{x+7} + \frac{4x}{x-7} = \frac{3x+7}{x-7}$, Joan's first step is to multiply both sides by the least common denominator. Which statement is true?

1) -14 is an extraneous solution.
2) 7 and -7 are extraneous solutions.
3) 7 is an extraneous solution.
4) There are no extraneous solutions.

22. To solve $\frac{2x}{x-2} - \frac{11}{x} = \frac{8}{x^2 - 2x}$, Ren multiplied both sides by the least common denominator. Which statement is true?

1) 2 is an extraneous solution.
2) $\frac{7}{2}$ is an extraneous so1ution.
3) 0 and 2 are extraneous solutions.
4) This equation does not contain any extraneous solutions.

23. Jin solved the equation $\sqrt{4-x} = x + 8$ by squaring both sides. What extraneous solution did he find?

1) -5
2) -12
3) 3
4) 4

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Solving Quadratic Systems Algebraically

Solve each of the following systems of equations for all values of x and y

1. $y = x^2 - 3x + 1$
   $y = -5x + 9$

2. $y = x^2 - 5x + 7$
   $y = -2x + 17$

3. $y = x^2 - 5x + 1$
   $y = -5x + 10$

4. $y = 2x^2 - 7x + 4$
   $y = 11 - 2x$

5. $y = x^2 - 4x + 3$
$y + 1 = x$

6. $y = 3x - 1$
$y + 5 = x^2$

7. $x^2 + y^2 = 10$
$x = y - 4$

8. $x^2 + y^2 = 2$
$y + 2 = x$

9. $x^2 + y^2 = 34$
$y - x = 2$

10. $x^2 + y^2 = 25$
$y + 5 = 2x$

11. $(x+2)^2+(y-4)^2=40$
$y=x+2$

12. $(x-2)^2+(y-3)^2=16$
$x+y-1=0$

13. $x+y=5$
$(x+3)^2+(y-3)^2=53$

14. $(x-3)^2+(y+2)^2=16$
$2x+2y=10$

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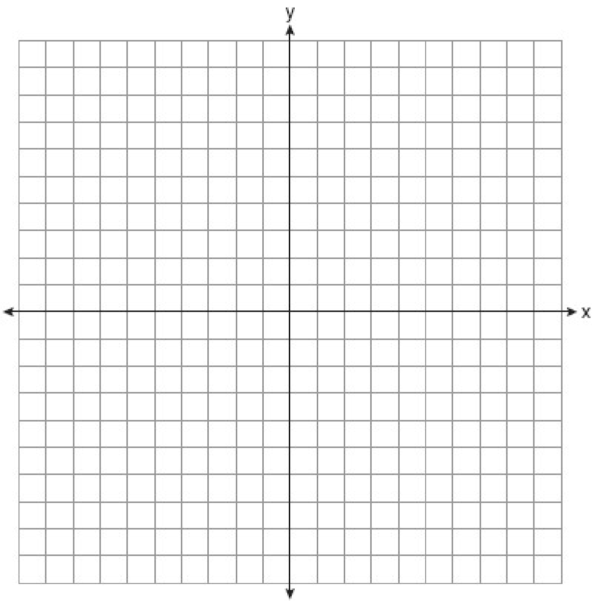
Quadratic Systems of Equations Graphically

Solve the following systems of equations *graphically*

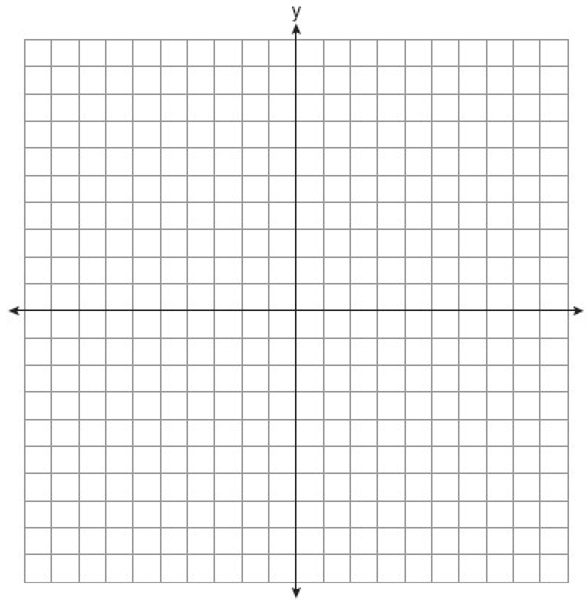
1. $y = -x^2 + 9$

   $y - x = 9$



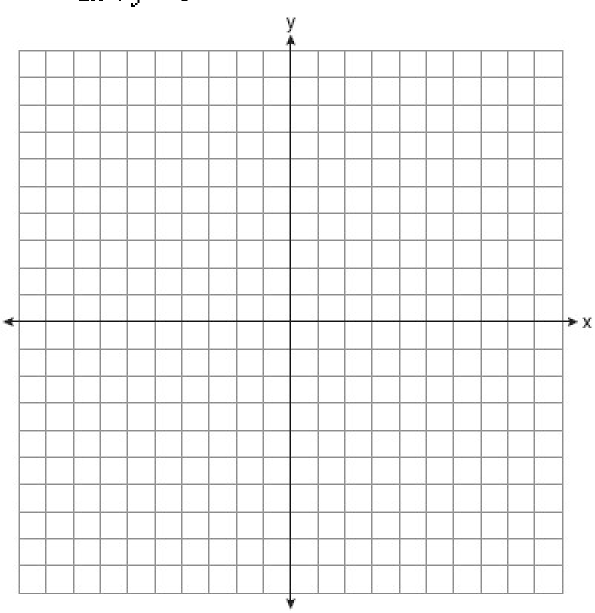
2. $y = x^2 - 2x$

   $y = x$



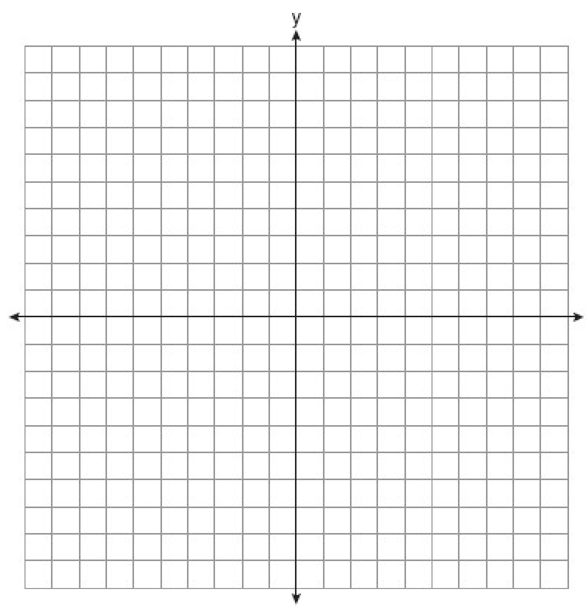
3. $y = x^2 - 6x + 5$

   $2x + y = 5$



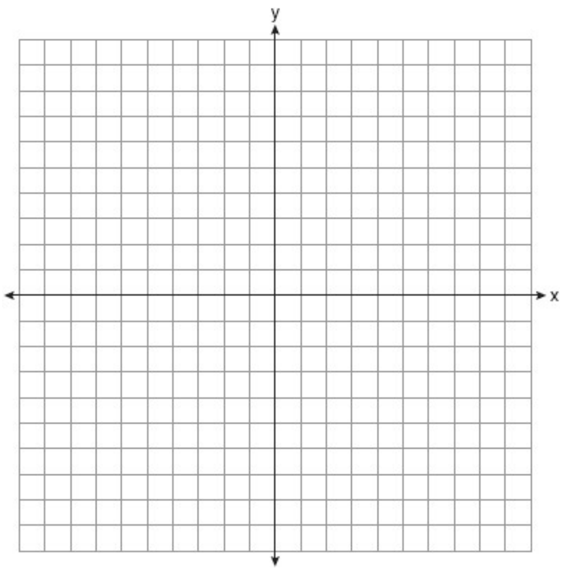
4. $y = -x^2 + 6x - 3$

   $x + y = 7$



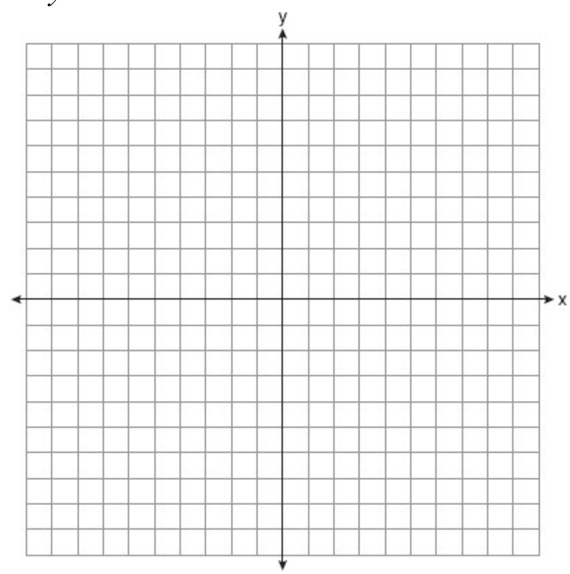
5. $y = -x^2 + 2x - 1$

$y + x = 1$



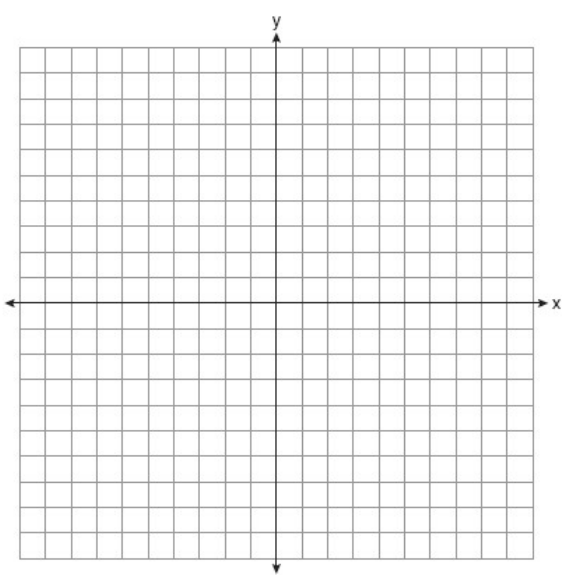
6. $y = x^2 + 6x - 1$

$y + 1 = -x$



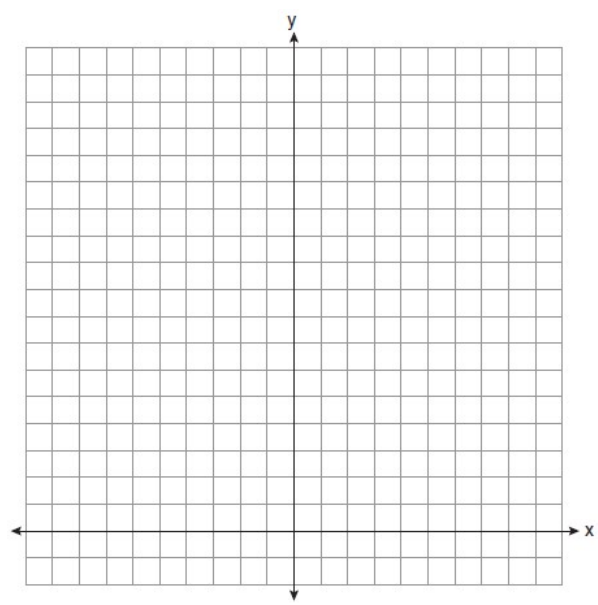
7. $y = x^2 - 6x + 1$

$y + 2x = 6$



8. $y = -x^2 - 4x + 12$

$y = -2x + 4$



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Reducing Negative Radicals

Reduce the following radicals

1. $\sqrt{12}$

2. $\sqrt{50}$

3. $\sqrt{162}$

4. $\sqrt{40}$

5. $\sqrt{45}$

6. $\sqrt{108}$

7. $\sqrt{63}$

8. $\sqrt{125}$

9. $\sqrt{-18}$

10. $\sqrt{-50}$

11. $\sqrt{-28}$

12. $\sqrt{-75}$

13. $\sqrt{-20}$

14. $\sqrt{-54}$

15. $\sqrt{-180}$

16. $\sqrt{-32}$

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Solving Quadratic Equations Using the Quadratic Formula

1. $x^2 + x = 1$

2. $2x^2 + 6x - 3 = 0$

3. $x^2 + 4x = -8$

4. $x^2 - 6x = 9$

5. $2x^2 - 6x = -5$

6. $3x^2 = 4x - 2$

7. $x^2 - 6x + 4 = 0$

8. $4x^2 + 4x = 5$

9. $x^2 - 6x = -3$

10. $4x^2 + 2x = -1$

11. $4x^2 = 8x + 1$

12. $2x^2 = 4x - 1$

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Solving Quadratic Equations Regents Practice

1. What are the solutions to $4x^2 - 7x - 2 = -10$

1) $-\frac{1}{4}, 2$

2) $\frac{7}{8} \pm \frac{\sqrt{79}}{8} i$

3) $\frac{7}{8} \pm \frac{\sqrt{241}}{8}$

4) $\frac{7}{8} \pm \frac{\sqrt{143}}{8} i$

2. The solutions to the equation $3x^2 - 4x + 2 = 2x - 3$ are

1) $\frac{2}{3} \pm \frac{\sqrt{2}}{3} i$

2) $1 \pm \frac{\sqrt{6}}{3} i$

3) $1 \pm \frac{\sqrt{12}}{3}$

4) $1 \pm 2\sqrt{6}i$

3. The roots of the equation $0 = x^2 + 6x + 10$ in simplest $a + bi$ form are

1) $-3 \pm 2i$

2) $-6 \pm i$

3) $-3 \pm i$

4) $-3 \pm i\sqrt{2}$

4. The roots of the equation $x^2 - 4x = -13$ are

1) $2 \pm 3i$

2) $2 \pm 6i$

3) $2 \pm \sqrt{17}$

4) $2 \pm \sqrt{13}$

5. A solution of the equation $2x^2 + 3x + 2 = 0$ is

1) $-\frac{3}{4} + \frac{1}{4} i\sqrt{7}$

2) $-\frac{3}{4} + \frac{1}{4} i$

3) $-\frac{3}{4} + \frac{1}{4} \sqrt{7}$

4) $\frac{1}{2}$

6. The solutions to the equation $-\frac{1}{2}x^2 = -6x + 20$ are

1) $-6 \pm 2i$
2) $-6 \pm 2\sqrt{19}$
3) $6 \pm 2i$
4) $6 \pm 2\sqrt{19}$

7. Which equation has roots of $3 + i$ and $3 - i$?

1) $x^2 - 6x + 10 = 0$

2) $x^2 + 6x - 10 = 0$

3) $x^2 - 10x + 6 = 0$

4) $x^2 + 10x - 6 = 0$

8. If a solution of $2(2x-1)=5x^2$ is expressed in simplest $a+bi$ form, the value of *b* is

1) $\frac{\sqrt{6}}{5}i$
2) $\frac{\sqrt{6}}{5}$
3) $\frac{1}{5}i$
4) $\frac{1}{5}$

Solve the following equations and express your answer in *simplest a+bi form*.

9. $x^2+3x+11=0$

10. $3x^2+5x+8=0$

11. $x^2+4x=-8$

12. $4x^2+2x=-1$

13. $2x^2-6x=-5$

14. $3x^2=4x-2$

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Solving Quadratic Equations Using Isolate/Square Root Method

Solve for x and express your answers in simplest radical form or simplest *a+bi* form if necessary

1. $x^2 - 4 = 0$

2. $x^2 + 4 = 0$

3. $x^2 - 25 = 0$

4. $x^2 + 49 = 0$

5. $x^2 + 81 = 0$

6. $x^2 - 100 = 0$

7. $2x^2 - 20 = 12$

8. $3x^2 + 21 = -54$

9. $x^2 - 12 = 0$

10. $x^2 + 40 = 0$

11. $x^2 - 28 = 0$

12. $x^2 + 108 = 0$

13. $x^2 + 44 = 0$

14. $x^2 - 54 = 0$

15. $-3x^2 + 39 = -33$

16. $2x^2 - 8 = -108$

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Polynomial Equations with Irrational/Imaginary Solutions

Solve each of the following equations and express irrational answers in simplest radical form or simplest $a+bi$ form

1. $x^4+8x^2=9$

2. $x^4+4x^2=45$

3. $x^3+3x^2+4x+12=0$

4. $x^3-3x^2=-16x+48$

5. $x^4-6x^2=-8$

6. $x^3+4x^2-2x=8$

7. $x^4 - 4x^2 - 32 = 0$

8. $x^3 - 3x^2 - 5x + 15 = 0$

9. $2x^3 - 3x^2 = -18x + 21$

10. $x^4 - 6x^2 - 27 = 0$

11. $x^4 + 4x^3 + 4x^2 = -16x$

12. $3x^5 - 48x = 0$

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Power of i

Evaluate each of the following:

1. i^{11} 2. i^{33} 3. i^{74} 4. i^{92}

5. i^{115} 6. i^{341} 7. i^{708} 8. i^{214}

9. $2i^{38}$ 10. $-4i^{28}$ 11. $-6i^{103}$ 12. $7i^{207}$

13. $2i^{19} + 3i^{24}$ 14. $5i^{97} - 6i^{23}$

15. $4i^{104} + 2i^{331}$ 16. $-2i^{34} - 3i^{224}$

17. $2xi^{15} - 6xi^{20}$

18. $3mi^{47} - 2mi^{98}$

19. $3xi^{65} - 2xi^{92} - 4xi^{11}$

20. $-2yi^{87} + 3xi^{41} - 7xi^{117}$

21. $-2ai^{49} - 3bi^{27} + 3ai^{225}$

22. $6ki^{28} + 4pi^{31} - 8pi^{73}$

23. $8xi^{10} - 4yi^{19} + 2yi^{3} - 6xi$

24. $3xi^{39} + 3yi^{9} - 5yi^{83} + 2xi^{214}$

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Operations with Complex Numbers

Multiply the following pairs of complex numbers and express in a + b*i* form

1. $(-2 + 9i) + (6 + 8i)$

2. $(-10 + 2i) + (7 + 6i)$

3. $(5 - 2i) - (2 - 3i)$

4. $(-2 + 2i) - (8 - i)$

5. $(7 - 2i) \bullet (8 + 3i)$

6. $(6 - i) \bullet (8 - 5i)$

7. $(5 - 2i) \bullet (2 - 3i)$

8. $(-2 + 2i) \bullet (8 - i)$

9. $(-2 + 9i) \bullet (6 + 8i)$

10. $(-7 + 2i) \bullet (7 + 6i)$

11. $(2-yi)^2$

12. $(3-7i)^2$

13. $(3k-2i)^2$

14. $(4x-3yi)^2$

15. $3xi(3-2i)$

16. $5i+4i(2+3i)$

17. $2xi(i-4i^2)$

18. $6xi^3(-4xi+5)$

19. $2i(\sqrt{-4}-4)$

20. $-\frac{1}{2}i^3\left(\sqrt{-9}-4\right)-3i^2$

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Mr. Schlansky Algebra II

Equations and Systems Review Sheet

1. The solution set of the equation $\sqrt{2x-4} = x-2$ is
1) $\{-2,-4\}$
2) $\{2,4\}$
3) $\{4\}$
4) $\{\ \}$

2. What is the solution set of the equation $\frac{30}{x^2-9}+1=\frac{5}{x-3}$?
1) $\{2,3\}$
2) $\{2\}$
3) $\{3\}$
4) $\{\ \}$

3. The solutions to the equation $3x^2-4x+2=2x-3$ are
1) $\frac{2}{3}\pm\frac{\sqrt{2}}{3}i$
2) $1\pm\frac{\sqrt{6}}{3}i$
3) $1\pm\frac{\sqrt{12}}{3}$
4) $1\pm 2\sqrt{6}i$

4. The roots of the equation $x^2-4x=-13$ are
1) $2\pm 3i$
2) $2\pm 6i$
3) $2\pm\sqrt{17}$
4) $2\pm\sqrt{13}$

5. Given i is the imaginary unit, $(2-yi)^2$ in simplest form is
1) $y^2-4yi+4$
2) $-y^2-4yi+4$
3) $-y^2+4$
4) y^2+4

6. The expression $6xi^3(-4xi+5)$ is equivalent to
1) $2x-5i$
2) $-24x^2-30xi$
3) $-24x^2+30x-i$
4) $26x-24x^2i-5i$

Solve the following equations algebraically

7. $3=-x+\sqrt{x+5}$

8. $x=2+\sqrt{x+4}$

9. $\frac{x}{x-1}=\frac{2}{x}+\frac{1}{x-1}$

10. $\frac{2}{x}-\frac{3x}{x+3}=\frac{x}{x+3}$

11. Solve for x and express your answer in simplest radical form: $x^2-6x=-12$

12. Solve for x and express your answer in simplest $a+bi$ form: $4x^2+2x=-1$

Solve the following in simplest *a+bi* or radical form

13. $x^4 - 6x^2 = 27$

14. $x^4 + 6x^2 = 40$

Express the following in simplest *a+bi* form

15. $(3k - 2i)^2$

16. $(4x - 3yi)^2$

17. $-2ai^{49} - 3bi^{27} + 3ai^{225}$

18. $6ki^{28} + 4pi^{31} - 8pi^{73}$

Spiral Review

To determine if $x - a$ is a factor:

Use remainder theorem and see if $p(a) = 0$. If the remainder is 0, it is a factor. If the remainder is not 0, it is not a factor.

19. Which binomial is *not* a factor of the expression $x^3 - 4x^2 - 25x + 28$?

1) $x+6$
2) $x-7$
3) $x-1$
4) $x+4$

20. Which binomial is a factor of the expression $x^4 + 4x^2 - 32$?

1) $x+8$
2) $x-8$
3) $x-1$
4) $x+2$