

Student: _____
Date: _____

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Course: Math1111-Summer2018

Assignment: Section 1.5 Homework

1. Use factoring to solve the quadratic equation. Check by substitution or by using a graphing utility and identifying x-intercepts.

$$x^2 - x - 56 = 0 \Rightarrow (x-8)(x+7) = 0$$

$$x-8=0 \Rightarrow x=8$$

$$x+7=0 \Rightarrow x=-7$$

The solution set is $\{-7, 8\}$.

(Use a comma to separate answers as needed. Type repeated roots only once.)

2. Use factoring to solve the quadratic equation. Check by substitution or by using a graphing utility and identifying x-intercepts.

$$4x^2 = 31x + 45$$

$$4x^2 - 31x - 45 = 0 \Rightarrow (4x+5)(x-9) = 0 \Rightarrow 4x+5=0 \Rightarrow x=-\frac{5}{4}$$

$$x-9=0 \Rightarrow x=9$$

The solution set is $\{-\frac{5}{4}, 9\}$.

(Use commas to separate answers as needed. Type repeated roots only once.)

3. Solve the following quadratic equation by the square root property.

$$2x^2 + 5 = 205$$

$$\Rightarrow 2x^2 = 205 - 5 \Rightarrow 2x^2 = 200 \Rightarrow x^2 = 100 \Rightarrow x = \pm \sqrt{100}$$

$$x = \pm 10 \Rightarrow x = -10$$

$$x = 10$$

The solution set is $\{-10, 10\}$.

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

4. Solve the following equation using the square root property.

$$2x^2 - 2 = -164$$

$$\Rightarrow 2x^2 = -164 + 2 \Rightarrow 2x^2 = -162 \Rightarrow x^2 = -81 \Rightarrow x = \pm \sqrt{-81}$$

The solution set is $\{-9i, 9i\}$.

(Simplify your answer. Express complex numbers in terms of i . Use a comma to separate answers as needed.)

$$\Rightarrow x = \pm \sqrt{81i^2} \Rightarrow x \pm 9i \Rightarrow x = -9i$$

$$x = 9i$$

5. Solve the equation by the square root property.

$$(x-8)^2 = 81$$

$$\Rightarrow x-8 = \pm \sqrt{81} \Rightarrow x = 8 \pm 9 \Rightarrow x = 8+9 = 17$$

$$x = 8-9 = -1$$

What is the solution set?

$\{-1, 17\}$ (Use a comma to separate answers as needed.)

6. Solve the quadratic equation using the square root property.

$$(x+8)^2 = -81$$

$$x+8 = \pm \sqrt{-81} \Rightarrow x = -8 \pm \sqrt{81i^2} \Rightarrow x = -8 \pm 9i$$

$$x = -8 + 9i$$

$$x = -8 - 9i$$

The solution set is $\{-8+9i, -8-9i\}$.

(Simplify your answer. Use a comma to separate answers as needed. Type an exact answer, using radicals as needed. Express complex numbers in terms of i .)

11. Solve the equation using the quadratic formula.

$$x^2 + 9x + 6 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}; a \neq 0$$

The solution set is $\left\{ \frac{-9 + \sqrt{57}}{2}, \frac{-9 - \sqrt{57}}{2} \right\}$.

(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

$$x = \frac{-9 \pm \sqrt{9^2 - 4(1)(6)}}{2(1)} = \frac{-9 \pm \sqrt{81 - 24}}{2} = \frac{-9 \pm \sqrt{57}}{2}$$

12. Solve the equation using the quadratic formula.

$$10x^2 = 2x + 3$$

$$\Rightarrow 10x^2 - 2x - 3 = 0$$

The solution set is $\left\{ \frac{1 + \sqrt{31}}{10}, \frac{1 - \sqrt{31}}{10} \right\}$.

(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(10)(-3)}}{2(10)} = \frac{2 \pm \sqrt{4 + 120}}{20} = \frac{2 \pm \sqrt{124}}{20}$$

$$x = \frac{2 \pm \sqrt{4(31)}}{20} = \frac{1 \pm \sqrt{31}}{10}$$

13. Compute the discriminant. Then determine the number and type of solutions of the given equation.

$$6x^2 - 8x + 6 = 0$$

$$\text{discriminant} = b^2 - 4ac$$

$$= (-8)^2 - 4(6)(6) = 64 - 144 = -80$$

Since it's negative under the radical

$$\sqrt{b^2 - 4ac} = \sqrt{-80}$$

We have two imaginary solutions.

What is the discriminant?

_____ (Simplify your answer.)

Choose the sentence that describes the number and type of solutions of the quadratic equation.

- A. There are two unequal real solutions.
- B. There is one real solution.
- C. There are two imaginary solutions.
- D. There are an infinite number of real solutions.

14. Compute the discriminant. Then determine the number and type of solutions of the given equation.

$$x^2 - 40x + 400 = 0$$

$$b^2 - 4ac = (-40)^2 - 4(1)(400) = 1600 - 1600 = 0$$

there is one real solution

What is the discriminant?

0 (Simplify your answer.)

Choose the sentence that describes the number and type of solutions of the quadratic equation.

- A. There are two imaginary solutions.
- B. There is one real solution.
- C. There are two unequal real solutions.
- D. There are an infinite number of real solutions.

15. Solve the equation by the method of your choice.

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

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

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-2)}}{2(2)} = \frac{3 \pm \sqrt{9 + 16}}{4} = \frac{3 \pm \sqrt{25}}{4}$$

The solution set is $\left\{ -\frac{1}{2}, 2 \right\}$.

(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

$$= \frac{3 \pm 5}{4} \Rightarrow \frac{3+5}{4} = \frac{8}{4} = 2$$

$$\text{and } \frac{3-5}{4} = -\frac{2}{4} = -\frac{1}{2}$$

16. Solve the equation by the method of your choice.

$$(9x - 2)^2 = 4$$

$$9x - 2 = \pm \sqrt{4} \Rightarrow 9x = 2 \pm 2 \Rightarrow 9x = 2 + 2 \Rightarrow x = \frac{4}{9}$$
$$9x = 2 - 2 \Rightarrow x = \frac{0}{9} = 0$$

The solution set is $\{0, \frac{4}{9}\}$.

(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

17. Solve the equation using the method of your choice.

$$y^2 - 10y + 26 = 0$$

$$X = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(26)}}{2(1)} = \frac{10 \pm \sqrt{100 - 104}}{2}$$

The solution set is $\{5+i, 5-i\}$.

$$\Rightarrow X = \frac{10 \pm \sqrt{-4}}{2} = \frac{10 \pm 2i}{2} = \frac{2(5 \pm i)}{2}$$

(Type an exact answer, using radicals as needed. Express complex numbers in terms of i . Use a comma to separate answers as needed.)

$$= 5 + i$$

$$\text{and } 5 - i$$

14. 0

B. There is one real solution.

15. $2, -\frac{1}{2}$

16. $\frac{4}{9}, 0$

17. $5 + i, 5 - i$

1. $-7,8$

2. $-\frac{5}{4},9$

3. $-10,10$

4. $-9i,9i$

5. $-1,17$

6. $-8+9i, -8-9i$

7. 49

$$x^2 + 14x + 49$$

$$(x+7)^2$$

8. $\frac{1}{4}$

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

$$\left(x - \frac{1}{2}\right)^2$$

9. 5, -7

10. $\frac{2+\sqrt{6}}{4}, \frac{2-\sqrt{6}}{4}$

11. $\frac{-9+\sqrt{57}}{2}, \frac{-9-\sqrt{57}}{2}$

12. $\frac{1+\sqrt{31}}{10}, \frac{1-\sqrt{31}}{10}$

13. -80

C. There are two imaginary solutions.
