

1. Use the discriminant to find what type of solutions the equation has. Do not solve the equation.

$$4x^2 + 7x = 1$$

What type of solutions does the equation have?

- ☐ Two rational solutions
- ☐ Two irrational solutions
- ☐ One rational solution
- ☐ Two nonreal complex solutions

2. Use the discriminant to find what type of solutions the equation has. Do not solve the equation.

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

What type of solutions does the equation have?

- ☐ Two rational solutions
- ☐ Two irrational solutions
- ☐ One rational solution
- ☐ Two nonreal complex solutions

3. Use the discriminant to find what type of solutions the equation has. Do not solve the equation.

$$5x^2 + 5 = -10x$$

What type of solutions does the equation have?

- ☐ Two rational solutions
- ☐ Two irrational solutions
- ☐ One rational solution
- ☐ Two nonreal complex solutions

4. Solve by the quadratic formula and simplify.

$$x^2 = -\frac{7}{8}x$$

$x = \boxed{}$ (Use a comma to separate answers, as needed.)

5. Solve by the quadratic formula and simplify.

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

$x = \square$ (Use a comma to separate answers, as needed.)

6. Simplify the equation. Then solve by the quadratic formula.

$$x(x + 3) - 5 = 3x + 20$$

$x = \square$

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

7. Solve by the quadratic formula.

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

$x = \square$

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

8. Solve by the quadratic formula.

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

$x = \square$

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

9. Solve by the quadratic formula.

$$7x^2 - 7x - 9 = 0$$

$x = \square$

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

10. Solve by the quadratic formula.

$$16x^2 + 4 = 15$$

$x = \square$

(Type exact answers, using radicals as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed. Express complex numbers in terms of i .)

11. Simplify the equation. Then solve by the quadratic formula.

$$4x(x + 2) - 8 = 2x - 7$$

$$x = \boxed{}$$

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

12. Simplify the equation. Then solve by the quadratic formula.

$$\frac{1}{30} + \frac{1}{y} = \frac{2}{y + 5}$$

$$y = \boxed{}$$

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

13. Write a quadratic equation having the given solutions.

$$-8, -5$$

$$\boxed{} = 0$$

(Type an equation whose terms have 1 as their greatest common factor.)

14. Write a quadratic equation having the given solutions.

$$10, 14$$

$$\boxed{} = 0$$

(Type an equation whose terms have 1 as their greatest common factor.)

15. A company that manufactures mountain bikes makes a daily profit p according to the equation $p = -200x^2 + 9800x - 106,928$, where p is measured in dollars and x is the number of mountain bikes made per day. Find the number of mountain bikes that must be made each day to produce a zero profit for the company.

To produce a zero profit, the company must make $\boxed{}$ mountain bikes per day.

(Round to the nearest whole number as needed. Use a comma to separate answers as needed.)