

Math 110 – Chapter 1 – Worksheet 1 – Version A

Linear Equations; Quadratic Equations; Complex Numbers and Quadratic Equations with non-real solutions.

Section 1.1 Linear Equations in One Variable

- Find the domain of the variable x in each equation. Write your answer in interval notation.
 - $2 = \frac{5}{x-1}$
 - $x - 2 = \sqrt{x}$
 - $2x - 3 = 7$
- Solve: $\frac{2}{3} - \frac{3}{2}x = \frac{1}{6} - \frac{7}{3}x$
- Solve: $3x - [2x - 6(x + 1)] = 7x - 1$
- Solve: $2(3x - 6) + 5 = 12 - (19 - 6x)$
- Use the formula: $F = \frac{9}{5}C + 32$ to find the temperature in degree Celsius, if the temperature is 50° Fahrenheit.
- Solve the formula $A = \frac{1}{2}h(a + b)$ for a .

Section 1.2 Applications of Linear Equations

- The length of a rectangle is 5 m more than twice its width. Find its dimensions if the perimeter is 28 m.
- Tyler invests \$15,000, some in stocks and the rest in bonds. If he invests three times as much money in stocks as he does in bonds, how much does he invest in each?
- Sara invests one-fifth of her capital is invested at 5%, one-sixth of her capital at 8%, and rest at 10% per year. If the annual interest she receives is \$130, what is Sara's capital?
- A train 130 meters long crosses a bridge in 21 seconds. The train travels at 25 meter per second. What is the length of the bridge?
- A trapezoid has an area of 35 square inches. If one base is 9 inches long and the other base 9 inches long, find the height of the trapezoid.

Section 1.3 Quadratic Equations

- Solve by factoring: $x^2 + 25x = -84$
- Solve by factoring: $2y^2 = 5y$
- Solve by factoring: $x^2 - 6x = -9$
- Solve by the Square-root method: $(x + 2)^2 = 5$
- Solve by completing the square: $x^2 - 6x + 7 = 0$
- Solve by completing the square: $4x^2 - 24x + 25 = 0$
- Solve using the quadratic formula: $6x^2 - x - 2 = 0$
- A rectangular building whose depth (from the front of the building) is three times its frontage is divided into two parts by a partition that is 45 feet from and parallel to the front wall. Assuming the rear portion of the building contains 2100 square feet, find the dimension of the building.

Section 1.4 Complex Numbers

20. Identify the real and imaginary parts of each complex number.
- a) $2 + 5i$
 - b) $7 - \frac{1}{2}i$
 - c) $-3i$
 - d) $3 + \sqrt{-25}$
21. Find a and b , if $(1 - 2a) + 3i = 5 - (2b - 5)i$
22. Write the following complex numbers in the standard form:
- a) $(4 + 3i) - (3 + 2i)$
 - b) $(3 - \sqrt{-9}) - (5 - \sqrt{-64})$
 - c) $(2 - 6i)(1 + 4i)$
 - d) $-3i(7 - 5i)$
 - e) $(-3 + 2i)^2$
23. Multiply the complex number $(1 - 3i)$ by its conjugate.
24. Write the quotient in standard form: $\frac{2}{1-i}$
25. Solve the quadratic equation: $x^2 = 4x - 13$
26. Use the discriminant of $2x^2 + 2x + 19 = 0$ to determine the number and type of solutions.