**UNIT 6 Non Real Numbers**

# REVIEW

**NAME:**_____

**DATE:**_____

**Simplify.**

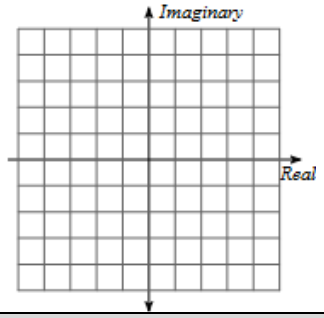
1. $i^{38}$

2. $\sqrt{-48}$

3. $3\sqrt{-54}$

**Graph.**

4. $4 - 5i$




**Perform the indicated operation. Express in standard form.**

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

6. $(2 + 6i)(-8 + 5i)$

7. $\frac{6+5i}{4-3i}$

**Solve. Express your radical solutions in the simplest form.**

8. $(x - 3)^2 + 16 = 4$

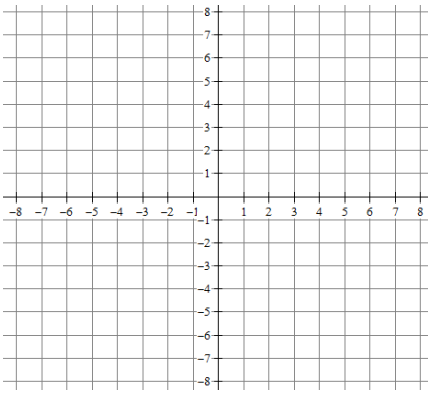
9. $(3y + 2)^2 + 10 = -18$

**Solve by completing the square.**

10. $2r^2 - 8r - 11 = 5$

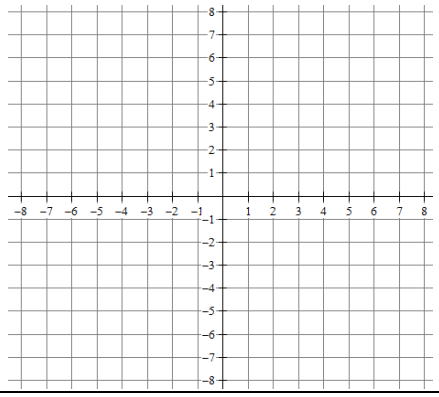
**Write the quadratic function in vertex form. Find the roots. Graph it! Label the vertex and roots.**

11. $y = -2x^2 - 12x - 17$

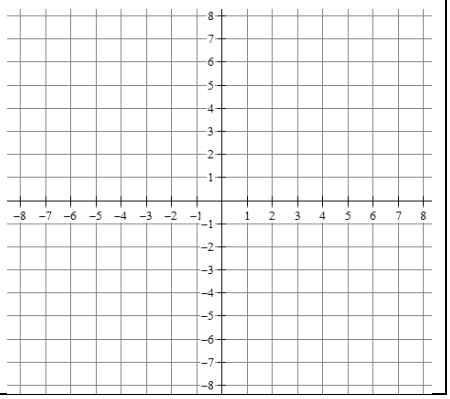


**Solve using the quadratic formula. Check your solution by graphing. Label the vertex and the root(s).**

12. $0 = \frac{1}{2}x^2 + 2x - 1$



13. $5x^2 + 6x - 7 = 6x^2 + 4$



14. What is the discriminant of a quadratic function? What does it tell you about the solutions?

# APPLICATION

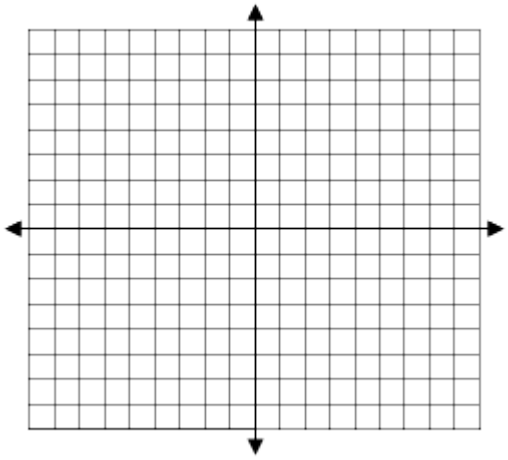
**GRAPH IT!**

1. Fill in the table and graph. Check with your graphing calculator!

$$y = \sqrt{x^2 + x - 4}$$

| *x* | *y* |
|---|---|
| -8 | |
| -6 | |
| -4 | |
| -2 | |
| 0 | |
| 2 | |
| 4 | |
| 6 | |
| 8 | |

a. Find the roots of the quadratic function in the square root. These are also the roots of the entire function because the square root of zero is zero. Plot and label these points on your graph.



b. Find the axis of symmetry of the quadratic in the square root. How does this relate to your graph?

c. State the domain and range of this function.

**ELECTRIC! Boogey woogey woogey woogey**

2. Use the formula to answer the following:

$$E = I \cdot Z$$

where $E$ is voltage (volts), $I$ is current (amps), and $Z$ is impedance (ohms)

a. The current in a circuit is $12 + j4$ amps and the impedance is $5 - j2$ ohms. What is the voltage?

b. The voltage in a circuit is $35 + j12$ volts and the impedance is $3 + j5$ ohms. What is the current?

**VERTICAL MOTION** An object that travels up and down is modeled by the quadratic function below:

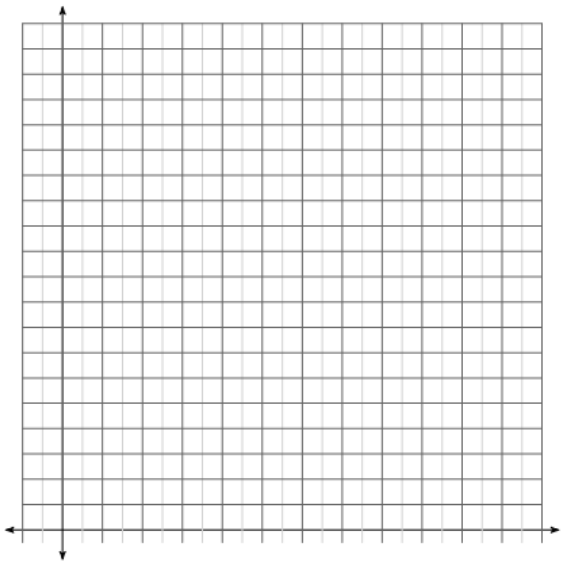
$$h(t) = -16t^2 + v_0 t + h_o$$

$h$ = height of object (feet), $t$ = time (seconds), $v_0$= initial velocity of object (ft/sec), $h_o$= initial height of object (feet)

3. Bob sets a bottle rocket up on a 4 foot table. The bottle rocket is shot straight into air with a velocity of 140 ft/sec.

a. Write the equation that models this. Sketch a graph of the height of the bottle rocket over time. LABEL IT!

b. What does $h(2.5)$ mean? Find it.



c. When will the rocket be 70 feet in the air?

d. Find the maximum height of the rocket.

a. When does the rocket hit the ground?