TEKS 2A.9.D, 2A.9.E

⭐ **LESSON 8-8** # Technology Lab
Solving Square Root Equations and Inequalities

Use with Lesson 8-8

You can use a graphing calculator to solve square root equations and inequalities.

Activity 1

Solve $\sqrt{x + 4} = 3$ by using a graph and a table.

Step 1 Enter $\sqrt{(x + 4)}$ for **Y1** and **3** for **Y2**, as shown.

```
Plot1 Plot2 Plot3
\Y1■√(X+4)
\Y2■3
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

Step 2 Find the point where the graph of **Y1** intersects the graph of **Y2**. Press **GRAPH** to view the graphs of the functions. Find the intersection point or points by pressing **2nd** **TRACE** (CALC) and using the **intersect** feature.

```
Intersection
X=5        Y=3
```
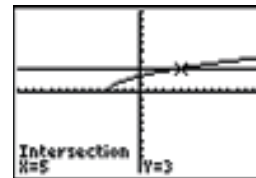
The screen shows that **Y1** and **Y2** have the same value when $x = 5$. Therefore, the solution of the equation $\sqrt{x + 4} = 3$ is $x = 5$.

Step 3 Check your answer by using a table to find the value of *x* for which **Y1** equals **Y2**. Press **2nd** **GRAPH** (TABLE). The table confirms that **Y1** and **Y2** have the same value when $x = 5$.

```
X    Y1      Y2
2    2.4495  3
3    2.6458  3
4    2.8284  3
5            3
6    3.1623  3
7    3.3166  3
8    3.4641  3
X=5
```

Try This

Solve by using a graph and a table.

1. $\sqrt{x + 5} = 2$ **2.** $\sqrt{4x} = 6$ **3.** $\sqrt{x - 1} = 3$

_____   _____   _____

4. $\sqrt{2x + 2} = 4$ **5.** $\sqrt{-27x} = 9$ **6.** $\sqrt{x + 18} = 5$

_____   _____   _____

Holt Algebra 2

Technology Lab

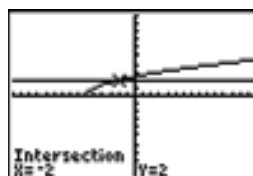**LESSON 8-8** *Solving Square Root Equations and Inequalities* continued

Activity 2

Solve $\sqrt{x + 6} \le 2$ by using a graph and a table.

Step 1 Enter $\sqrt{(x + 6)}$ for **Y1** and **2** for **Y2**, as shown.

```
Plot1 Plot2 Plot3
\Y1■√(X+6)
\Y2■2■
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

Step 2 Press **GRAPH** to view the graphs of the functions. The screen shows that **Y1** is undefined when $x < -6$ and that **Y1** and **Y2** have the same value when $x = -2$.

The value of **Y1** is less than or equal to the value of **Y2** when $x \ge -6$ or when $x \le -2$. Therefore, the solution of the inequality $\sqrt{x + 6} \le 2$ is $-6 \le x \le -2$.

```
              /
..........|....../........
Intersection
X=-2        Y=2
```

Step 3 Check your answer by using a table to find values of x for which **Y1** is less than or equal to **Y2**. Press **2nd** **GRAPH**(TABLE). The table supports the answer that **Y1** is less than or equal to **Y2** when $x \ge -6$ or when $x \le -2$. Notice that **Y1** is undefined when $x < -6$.

```
 X    │ Y1    │ Y2
-7    │ ERROR │ 2
-6    │ 0     │ 2
-5    │ 1     │ 2
-4    │ 1.4142│ 2
-3    │ 1.7321│ 2
-2    │ 2     │ 2
-1    │ 2.2361│ 2
X=-7
```

Try This

Solve by using a graph and a table.

  1. $\sqrt{x + 7} < 1$ **2.** $\sqrt{x - 6} > 2$ **3.** $\sqrt{2x - 1} \ge 3$

_____   _____   _____

  4. $4\sqrt{x + 4} \le 8$ **5.** $\sqrt{-3x - 8} > 4$ **6.** $\sqrt{-x + 7} < 3$

_____   _____   _____

Holt Algebra 2

Answer Key continued

TECH LAB 8-5A

Activity 1

Try This

1. $x = -2$
2. $x = -3$
3. $x = 4$
4. $x = 5$
5. $x = 4$
6. $x = \pm 2$

Activity 2

Try This

1. $x < 4$ or $x > 6$
2. $7 < x < 8$
3. $x < -2$ or $x \geq -1$
4. $x \leq -4$ or $x > -3$
5. $4 < x < 10$
6. $x < 0$ or $x > 3$

TECH LAB 8-5B

Activity 1

Try This

1. 6 days

Activity 2

Try This

1. 4 mi/h

TECH LAB 8-8

Activity 1

Try This

1. $x = -1$
2. $x = 9$
3. $x = 10$
4. $x = 7$
5. $x = -3$
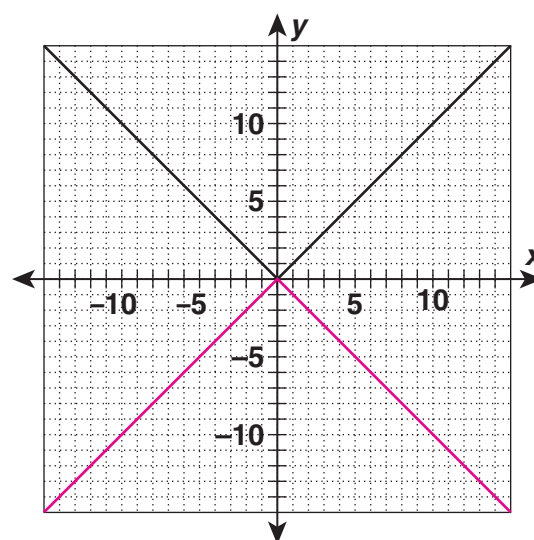6. $x = 7$

Activity 2

Try This

1. $-7 < x < -6$
2. $x > 10$
3. $x \geq 5$
4. $-4 < x < 0$
5. $x < -8$
6. $-2 < x < 7$

LAB 9-3

Try This

1.

2.

Holt Algebra 2