

Graph  $f(x) = 2\sqrt{x+3} + 4$

Parent Function

$$y = \sqrt{x}$$

Domain  $[-3, +\infty)$

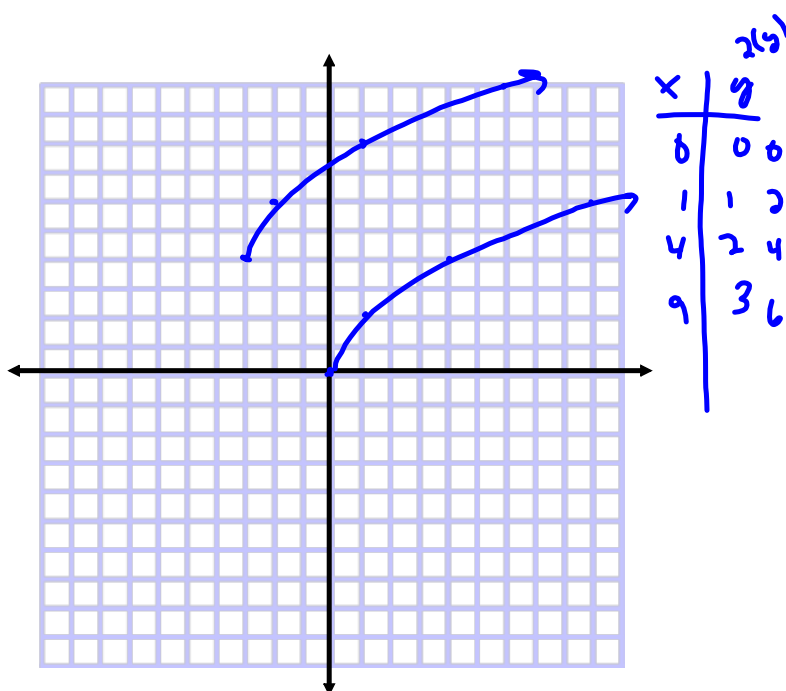
Range  $[4, +\infty)$

Horizontal Shift

$$|p| + 3$$

Vertical Shift Up 4

Stretch Vertical 2



Graph  $f(x) = \sqrt[3]{x-5} + 2$

Parent Function

$$y = \sqrt[3]{x}$$

Domain

$$(-\infty, +\infty)$$

Range

$$(-\infty, +\infty)$$

Horizontal Shift

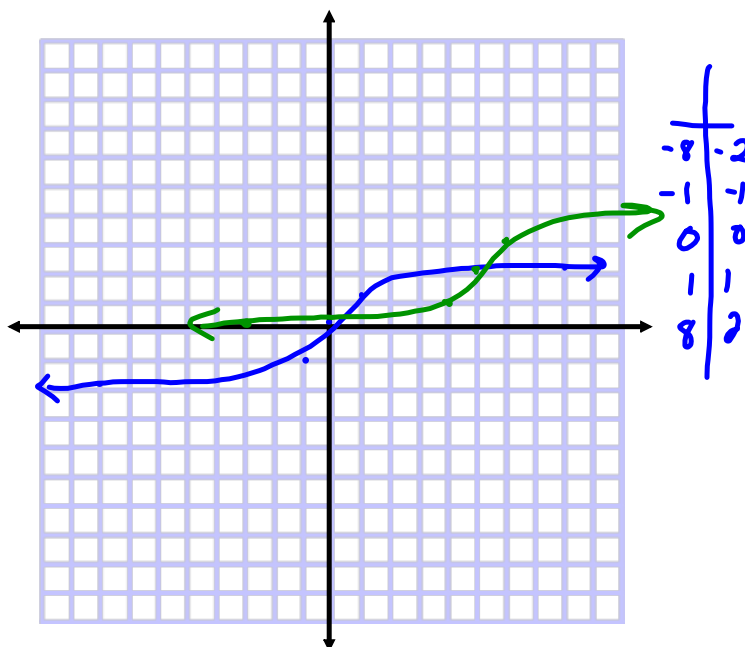
Right 5

Vertical Shift

Up 2

Stretch

NA



## Notes: 6.6 Solving Radical Equations

## Solving Radical Equations

To solve a radical equation, follow these steps:

- STEP 1** **Isolate** the radical on one side of the equation, if necessary.
- STEP 2** **Raise** each side of the equation to the same power to eliminate the radical and obtain a linear, quadratic, or other polynomial equation.
- STEP 3** **Solve** the polynomial equation using techniques you learned in previous chapters. Check your solution.

Solve  $\left(\sqrt[3]{2x+7}\right)^3 = 3$ .

$$2x+7 = 3^3$$

$$2x+7 = 27$$

$$\begin{array}{r} -7 \\ -7 \end{array}$$

$$\frac{2x}{2} = \frac{20}{2} \quad x=10$$

$$\begin{array}{l} \sqrt[3]{2(10)+7} \quad \sqrt[3]{27} = 3 \\ \phantom{\sqrt[3]{}} \quad \quad \quad \frac{1}{3} \cdot 3 \\ (2x+7) \quad \quad \quad 2x+7 \end{array}$$

$$\left(\sqrt{x + 25}\right)^2 = (4)^2$$

$$\begin{array}{r} x + 25 = 16 \\ - 25 \quad - 25 \\ \hline x = -9 \end{array}$$

$$\frac{2\sqrt[3]{x-3}}{2} = \frac{4}{2}$$
$$\left(\sqrt[3]{x-3}\right)^3 = (2)^3$$

$$\begin{array}{r} x - 3 = 8 \\ + 3 \quad + 3 \\ \hline x = 11 \end{array}$$

Challenge...  $(x)^2 = (\sqrt{12-x})^2$

$$x^2 = 12 - x$$

$$\begin{aligned} x - 3 &= 0 \\ x &= 3 \end{aligned}$$

$$x^2 + x - 12 = 0$$

$$(x + 4)(x - 3) = 0$$

$$\begin{aligned} x &= -4 & x &= 3 \end{aligned}$$

Check your answers

Extraneous solution  
 $-4 = \frac{12+4}{\sqrt{16}}$

Extreme Challenge...

$$(x+1)^2 = (\sqrt{7x+15})^2$$

$$(x+1)(x+1)$$

$$x^2 + 2x + 1 = 7x + 15$$

$$\quad \quad \quad -7x \quad -15 \quad -7x \quad -15$$

$$x^2 - 5x - 14 = 0$$

$$(x-7)(x+2)$$

$$x=7 \quad x=-2 \in \text{ext sol}$$



## Partner Paper

**EQUATIONS WITH SQUARE ROOTS** Solve the equation. Check your solution.

3.  $\sqrt{5x + 1} = 6$

4.  $\sqrt{3x + 10} = 8$

5.  $\sqrt{9x} + 11 = 14$

6.  $\sqrt{2x} - \frac{2}{3} = 0$

7.  $-2\sqrt{24x} + 13 = -11$

8.  $8\sqrt{10x} - 7 = 9$

**SOLVING RADICAL EQUATIONS** Solve the equation. Check for extraneous solutions.

34.  $x - 6 = \sqrt{3x}$

35.  $x - 10 = \sqrt{9x}$

36.  $x = \sqrt{16x + 225}$



## Attachments

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Practice Test B (Timed).ppt