Algebra 1

<u>Our Goal</u>: To learn to solve square root equations

<u>Warm Up</u>: Have your homework out for checking, please

<u>Today's Homework</u>:
10.3 Textbook Exercises, p.564: 4-34 (evens)

<u>Previous Homework</u>
None

$$V = \frac{4}{3}\pi r^3$$

$$r = \sqrt[3]{\frac{3}{4\pi}V}$$

⟳ Core Concept

Squaring Each Side of an Equation

Words If two expressions are equal, then their squares are also equal.

Algebra If $a = b$, then $a^2 = b^2$.

Solve each equation.

a. $\sqrt{x} + 5 = 13$

$$\left(\sqrt{x}\right) = \left(8\right)$$

$$x = 64$$

b. $3 - \sqrt{x} = 0$

Solve the equation. Check your solution.

1. $\sqrt{x} = 6$

2. $\sqrt{x} - 7 = 3$

3. $\sqrt{y} + 15 = 22$

4. $1 - \sqrt{c} = -2$

Solve the equation.

$$4\sqrt{x+2} + 3 = 19$$

$$4\sqrt{x+2} = 16$$

$$\sqrt{x+2} = \frac{16}{4} = 4$$

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

$$x + 2 = 16$$

$$x = 14$$

Solve $\sqrt{2x-1} = \sqrt{x+4}$.

$$\left(\sqrt{2x-1}\right)^2 = \left(\sqrt{x+4}\right)^2$$

$$2x - 1 = x + 4$$

$$2x - x = 4 + 1$$

$$x = 5$$

$$x = 5$$

Solve the equation. Check your solution.

5. $\sqrt{x+4}+7=11$

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

$x+4=16$

$\boxed{x=12}$

6. $15=6+\sqrt{3w-9}$

$\sqrt{3w-9}=9$

$(\sqrt{3w-9})^2=81$

$3w-9=81$

$3w=90$

$\boxed{w=30}$

7. $\sqrt{3x+1}=\sqrt{4x-7}$

$(\sqrt{3x+1})^2=(\sqrt{4x-7})^2$

$3x+1=4x-7$

$-1x=-8$

$\boxed{x=8}$

Solve $x=\sqrt{x+6}$.

$(\sqrt{x+6})^2=(x)^2$

$x+6=x^2$

$0=x^2-x-6$

$0=(x+2)(x-3)$

$x=-2, 3$

$-2=\sqrt{-2+6}$

$-2\neq\sqrt{4}$

13. $\underline{x=3}$

Solve $13 + \sqrt{5n} = 3$.

$\sqrt{5n} = -10$

$(\sqrt{5n})^2 = (-10)^2$

$5n = 100$

$n = 20$

NO Solution

Solve the equation. Check your solution(s).

8. $\sqrt{4 - 3x} = x$

$(\sqrt{4-3x})^2 = (x)^2$

$4 - 3x = x^2$

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

$0 = (x + 4)(x - 1)$

$\frac{\sqrt{4-1}}{-8}$

$\sqrt{4 - 3(-4)} = -4$

$\sqrt{16} = -4$ $(-4, 1)$

9. $\sqrt{3m} + 10 = 19$

$(\sqrt{3m})^2 = -$

$3m = 81$

$m = $

10. $p + 1 = \sqrt{7p + 15}$

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

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

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

$(p + 2)(p - 7)$

$-2, 7$

$$\sqrt{-1+2} + (-1) = 0 \checkmark$$

$$\sqrt{x+2} + x = 0$$

$$\sqrt{x+2} = -x$$

$$(\sqrt{x+2})^2 = (-x)^2$$

$$x + 2 = x^2$$

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

$$(x - 2)(x + 1)$$

$$x = 2, -1$$