

H/W Review p. 112

(#40)  $\frac{\sqrt{x}}{x}$ ,  $x=4$

$$\frac{\sqrt{4}}{4} = \frac{2}{4} = \frac{1}{2}$$

(#41)  $\frac{\sqrt{x}}{5} - 17$ ,  $x=25$

$$\frac{\sqrt{25}}{5} - 17$$

$$\frac{5}{5} - 17$$

$$1 - 17 = \boxed{-16}$$

$$\frac{2}{4} + \frac{1}{4} =$$

$$\sqrt{x}, x=16$$

$$2x - \sqrt{5} = 2\sqrt{x+1}$$

$$x+2 = \frac{x}{4} - 1$$

$$\boxed{x - \frac{x}{4}} + 2 = -1$$

## Solving equations with radicals

→ KEY CONCEPT:

if  $a = b$ , then  $a^2 = b^2$

$x = 5$ , then  $x^2 = 5^2$

$2x = 7 + x$ , then  $(2x)^2 = (7 + x)^2$

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

$$2\sqrt{x} - 8 = 0$$

+8      +8

$$(2\sqrt{x})^2 = (8)^2$$

$$2^2 (\sqrt{x})^2 = 64$$

$$\frac{4}{4} x = \frac{64}{4}$$

$$\boxed{x = 16}$$

$$(ab)^2 = a^2 \cdot b^2$$

$$(\sqrt{x})(\sqrt{x}) = x$$

$$4\sqrt{x-7} + 12 = 28$$

$$\quad \quad -12 \quad -12$$

$$\frac{4\sqrt{x-7}}{4} = \frac{16}{4}$$

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

$$(\sqrt{x-7})(\sqrt{x-7}) = x-7$$

$$x-7 = 16+7 \neq \textcircled{23} + 2 \text{ (leap math year)}$$

$$\quad \quad +7$$

$$\underline{\underline{\cancel{x=25}}}$$

$$(\sqrt{3x-17})^2 = (\sqrt{x+21})^2$$

$$\begin{array}{r} 3x-17 = x+21 \\ -x \quad -x \end{array}$$

$$\begin{array}{r} 2x-17 = 21+17 \\ +17 \end{array}$$

$$\begin{array}{r} 2x = 38 \\ \hline 2 \quad 2 \end{array}$$

$$x=19$$

$$(\sqrt{6-x}) = (x)$$

$$\begin{array}{cc} 6-x & = & x^2 \\ +x & & +x \end{array}$$

$$\begin{array}{c} 6 = x^2 + x - 6 \\ -6 \end{array}$$

$$x^2 + x - 6 = 0$$

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

$$x+3=0$$

$$\boxed{x=-3}$$

$$x-2=0$$

$$\boxed{x=2}$$

$$\sqrt{6-(-3)} = (-3)$$

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

$$\cancel{3 = -3}$$

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

$$\sqrt{4} = 2$$

$$2 = 2 \checkmark$$

**Determine whether the given value is a solution of the equation.**

~~1.~~  $4\sqrt{2x-3} = 12$ ;  $\boxed{2}$   
 $4\sqrt{2(2)-3} = 12$   
 $4\sqrt{1} = 12$

~~2.~~  $2\sqrt{9x-1} = 20$ ;  $\boxed{7}$   
 $2\sqrt{9(7)-1} = 20$   
 $2\sqrt{62} = 20$

3.  $\sqrt{4x+8} = \sqrt{6+2x}$ ;  $-1$

$\sqrt{4(-1)+8} = \sqrt{6+2(-1)}$   
 $\sqrt{4} = \sqrt{4}$   
✓

~~4.~~  $\sqrt{7x-2} = \sqrt{8-3x}$ ;  $-1$

$\sqrt{7(-1)-2} = \sqrt{8-3(-1)}$   
 $\sqrt{-9} =$



Solve the equation. Check for extraneous solutions.

$$13. \quad 8\sqrt{x} - 32 = 0 + 32$$

$$+ 32$$

$$\frac{8\sqrt{x}}{8} = \frac{32}{8}$$

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

$$x = 16$$

$$8\sqrt{16} - 32 = 0$$

$$8 \cdot 4 - 32 = 0$$

$$32 - 32 = 0$$

$$0 = 0 \checkmark$$

$$14. \quad \sqrt{5x} - 4 = 16$$

$$+ 4 \quad + 4$$

$$(\sqrt{5x})^2 = 20^2$$

$$\frac{5x}{5} = \frac{400}{5}$$

$$x = 80$$

$$\sqrt{5 \cdot 80} - 4 = 16$$

$$\sqrt{400} - 4 = 16$$

$$20 - 4 = 16$$

$$16 = 16 \checkmark$$

$$15. \quad (\sqrt{x+3}) + 8 = 15$$

$$- 8 \quad - 8$$

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

$$x+3 = 49 - 3$$

$$- 3$$

$$x = 46$$

$$\sqrt{46+3} + 8 = 15$$

$$\sqrt{49} + 8 = 15$$

$$7 + 8 = 15$$

$$15 = 15 \checkmark$$

$$25. (\sqrt{7x-5})^2 = (\sqrt{3x+19})^2$$

$$\begin{array}{r} 7x-5 = 3x+19 \\ -3x+5 \quad -3x+5 \\ 4x = 24 \end{array}$$

$$\boxed{x=6}$$

$$\sqrt{7(6)-5} = \sqrt{3(6)+19}$$

$$\sqrt{42-5} = \sqrt{18+19}$$

$$\checkmark \sqrt{37} = \sqrt{37}$$

$$28. \sqrt{5x-6} = x$$

$$26. \sqrt{x-15} - \sqrt{x-7} = 0$$

$$\begin{array}{r} + \sqrt{x-7} \quad + \sqrt{x-7} \\ (\sqrt{x-15})^2 = (\sqrt{x-7})^2 \end{array}$$

$$\begin{array}{r} x-15 = x-7 \\ -x+7 \quad -x+7 \end{array}$$

$$x-8=0$$

no solution

$$29. x = \sqrt{2x+24}$$

$$27. \sqrt{10x-3} - \sqrt{8x-11} = 0$$

$$\begin{array}{r} + \sqrt{8x-11} \quad + \sqrt{8x-11} \\ (\sqrt{10x-3})^2 = (\sqrt{8x-11})^2 \end{array}$$

$$\begin{array}{r} 10x-3 = 8x-11 \\ -8x+3 \quad -8x+3 \end{array}$$

$$2x = -8$$

$$x = -4$$

$$\begin{array}{r} \sqrt{10(-4)-3} - \sqrt{8(-4)-11} = 0 \\ \sqrt{-40-3} \quad \sqrt{-32-11} \\ \sqrt{-43} = \sqrt{-43} \end{array}$$

$$30. \sqrt{2x-15} = x$$

Homework:

x. 732 3-19 (odd)

22-24 (all)

31-33 (all)

\* Test over 2.7 & 11.3 on \*

\* FRIDAY, 1/9/09 \*