

## Study Guide - Section 8.7 and 8.8

Key

Solve each equation. Remember to check for extraneous solutions.

1)  $(\sqrt{3n-1})^2 = (\sqrt{2n})^2$

$$\begin{array}{r} 3n-1 = 2n \\ -3n \quad -3n \end{array}$$

$$\frac{-1}{-1} = \frac{-n}{-1}$$

$$\boxed{n=1}$$

3)  $(x)^2 = (\sqrt{90-x})^2$

$$x^2 = 90-x$$

$$x^2 + x - 90 = 0$$

$$(x+10)(x-9) = 0$$

$$x = \cancel{10}$$

$$\boxed{x=9}$$

5)  $\sqrt{-2-3m} - \sqrt{3-3m} = -1$

$$(\sqrt{-2-3m})^2 = (-1 + \sqrt{3-3m})^2$$

$$-2-3m = (-1 + \sqrt{3-3m})(-1 + \sqrt{3-3m})$$

$$-2-3m = \underline{1} - \underline{\sqrt{3-3m}} - \underline{\sqrt{3-3m}} + \underline{3-3m}$$

$$\begin{array}{r} -2-3m = 4 - 2\sqrt{3-3m} - 3m \\ -4+3m \quad -4 \quad \quad \quad +3m \end{array}$$

$$\frac{-6}{-2} = \frac{-2\sqrt{3-3m}}{-2}$$

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

$$\frac{9}{-3} = \frac{3-3m}{-3}$$

$$\frac{6}{-3} = \frac{-3m}{-3} \quad \boxed{m=-2}$$

2)  $\sqrt{b+3} - 1 = b$

$$\begin{array}{r} +1 \quad +1 \end{array}$$

$$(\sqrt{b+3})^2 = (b+1)^2$$

$$\begin{array}{r} b+3 = b^2+2b+1 \\ -b-3 \quad \quad -b-3 \end{array}$$

$$b^2+b-2=0$$

$$(b+2)(b-1) = 0$$

$$b = \cancel{2}, \boxed{b=1}$$

4)  $(\sqrt{2n+3})^2 = (n+2)^2$

$$\begin{array}{r} 2n+3 = n^2+4n+4 \\ -2n-3 \quad \quad -2n-3 \end{array}$$

$$n^2+2n+1=0$$

$$(n+1)(n+1) = 0$$

$$\boxed{n=-1}$$

6)  $(x-4)^2 = (\sqrt{24-5x})^2$

$$\begin{array}{r} x^2-4x+4 = 24-5x \\ +5x-24 \quad -24+5x \end{array}$$

$$x^2+x-20=0$$

$$(x+5)(x-4) = 0$$

$$x = \cancel{5}$$

$$\boxed{x=4}$$

$$7) (\sqrt{15-2m})^2 = (1)^2$$

$$\frac{15-2m}{-15} = \frac{1}{-15}$$

$$\frac{-2m}{-2} = \frac{-14}{-2}$$

$$m = 7$$

$$8) -2 = \sqrt{5-2n} - \sqrt{3n+3}$$

$$(-2 + \sqrt{3n+3})^2 = (\sqrt{5-2n})^2$$

$$(-2 + \sqrt{3n+3})(-2 + \sqrt{3n+3}) = 5 - 2n$$

$$\frac{4 - 2\sqrt{3n+3} - 2\sqrt{3n+3} + 3n + 3}{-7 - 3n} = 5 - 2n$$

$$\frac{7 + 3n - 4\sqrt{3n+3}}{-7 - 3n} = 5 - 2n$$

$$(-4\sqrt{3n+3})^2 = (2 - 5n)^2$$

$$16(3n+3) = 25n^2 + 20n + 4$$

$$\frac{48n + 48}{-48n - 48} = \frac{25n^2 + 20n + 4}{-48n - 48}$$

$$10) (2 - \sqrt{1-3a})^2 = (\sqrt{1-a})^2$$

$$(2 - \sqrt{1-3a})(2 - \sqrt{1-3a}) = 1 - a$$

$$\frac{4 - 2\sqrt{1-3a} - 2\sqrt{1-3a} + 1 - 3a}{-5 + 3a} = 1 - a$$

$$\frac{5 - 3a - 4\sqrt{1-3a}}{-5 + 3a} = 1 - a$$

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

$$16(1-3a) = 16 - 16a + 4a^2$$

$$\frac{16 - 48a}{-16 + 48a} = \frac{4a^2 - 16a + 16}{+48a - 16}$$

$$4a^2 + 32a = 0$$

$$4a(a+8) = 0$$

$$\begin{matrix} a = 0 \\ a \neq 8 \end{matrix}$$

$$9) (\sqrt{-8+9b})^2 = (b)^2$$

$$-8 + 9b = b^2$$

$$b^2 - 9b + 8 = 0$$

$$(b-8)(b-1) = 0$$

$$\begin{matrix} b = 8 \\ b = 1 \end{matrix}$$

$$11) (3x+20)^{\frac{1}{2}} = (-4-x)^{\frac{1}{2}}$$

$$(\sqrt{3x+20})^2 = (\sqrt{-4-x})^2$$

$$\frac{3x+20}{+x} = \frac{-4-x}{+x}$$

$$\frac{4x+20}{-20 - 20} = -4$$

$$\frac{4x}{4} = \frac{-24}{4}$$

$$x = -6$$

$$12) 1 + (6n-6)^{\frac{1}{2}} = n$$

$$\frac{1 + \sqrt{6n-6}}{-1} = \frac{n}{-1}$$

$$(\sqrt{6n-6})^2 = (n-1)^2$$

$$\frac{6n-6}{-6n+6} = \frac{n^2-2n+1}{-6n+6}$$

$$n^2 - 8n + 7 = 0$$

$$(n-7)(n-1) = 0$$

$$\begin{matrix} n = 7 \\ n = 1 \end{matrix}$$

$$\rightarrow 25n^2 - 28n - 44 = 0$$

$$P(-1100) | S(-2)$$

$$\frac{-50}{22}$$

$$(25n^2 - 50n)(22n - 44) = 0$$

$$25n(n-2) + 22(n-2) = 0$$

$$(25n+22)(n-2) = 0$$

$$\begin{matrix} n = 2 \\ n = -\frac{22}{25} \end{matrix}$$

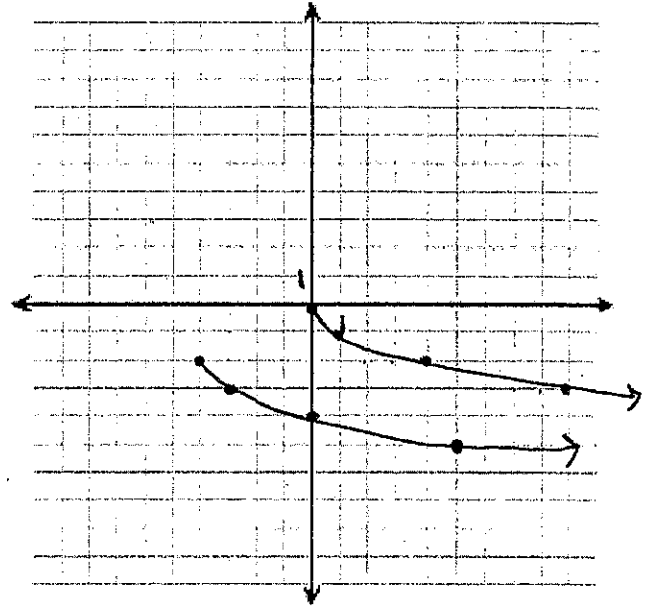
1. Graph the following radical function, then identify the domain and range.

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

Domain:  $[-4, \infty)$

Range:  $(-\infty, -2]$

x	y
0	0
1	-1
4	-2
9	-3



2. Graph the following radical function, then identify the domain and range.

$$y = \sqrt{-(x-1)} + 3$$

Domain:  $(-\infty, 1]$

Range:  $[3, \infty)$

x	y
0	0
-1	1
-4	2
-9	3

