

Radical Equations - Day Two CW

Date _____

Period _____

Solve each equation. Remember to check for extraneous solutions.

1) $\sqrt{90-n} = n$

$$90-n = n^2$$

$$-90 + n \quad +n - 90$$

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

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

$n = -10$ $n = 9$

$$\sqrt{90-(-10)} = -10$$

$$\sqrt{100} = -10$$

$$10 = -10$$

$$\sqrt{90-9} = 9$$

$$\sqrt{81} = 9$$

$$9 = 9 \checkmark$$

2) $\sqrt{42-x} = x$

$$42-x = x^2$$

$$x^2 + x - 42 = 0$$

$$(x-6)(x+7) = 0$$

$x = 6$ $x = -7$

$$\sqrt{42-6} = 6$$

$$\sqrt{36} = 6$$

$$6 = 6 \checkmark$$

$$\sqrt{42-(-7)} = -7$$

$$\sqrt{49} = -7$$

3) $\sqrt{64} = a$

$$8 = a$$

4) $\sqrt{12-n} = n$

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

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

$n = 3$ $n = -4$

$$\sqrt{12-3} = 3$$

$$\sqrt{9} = 3$$

$$3 = 3 \checkmark$$

$$\sqrt{12+(-4)} = -4$$

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

5) $x = \sqrt{-28+11x}$

$$x^2 - 11x + 28 = 0$$

$$(x-7)(x-4) = 0$$

$x = 7$ $x = 4$

$$7 = \sqrt{-28+11(7)}$$

$$7 = \sqrt{49}$$

$$7 = 7 \checkmark$$

$$4 = \sqrt{-28+11(4)}$$

$$4 = \sqrt{16}$$

$$4 = 4 \checkmark$$

6) $\sqrt{-70+17p} = p$

$$p^2 - 17p + 70 = 0$$

$$(p-10)(p-7) = 0$$

$p = 10$ $p = 7$

$$\sqrt{-70+17(10)} = 10$$

$$\sqrt{100} = 10$$

$$10 = 10 \checkmark$$

$$\sqrt{-70+17(7)} = 7$$

$$\sqrt{49} = 7$$

$$7 = 7 \checkmark$$

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

$$(x-1)^2 = -4x$$

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

$$x^2 + 2x + 1 = 0$$

$$(x+1)^2 = 0$$

$$x+1 = 0$$

$$x = -1$$

$$x^2 + 2x + 1 = 0$$

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

No Solution

Check

$$-1 = 1 + \sqrt{-4(-1)}$$

$$-1 = 1 + \sqrt{4}$$

$$-1 = 1 + 2$$

$$-1 = 3$$

8) $\sqrt{2p+3} = p+2$

$$2p+3 = (p+2)^2$$

$$2p+3 = p^2 + 4p + 4$$

$$p^2 + 2p + 1 = 0$$

$$(p+1)(p+1) = 0$$

$p = -1$

check

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

$$1 = 1 \checkmark$$

9) $x-6 = \sqrt{29-4x}$

$$(x-6)^2 = 29-4x$$

$$x^2 - 12x + 36 = 29 - 4x$$

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

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

$x = 7$ $x = 1$

check

$$1-6 = \sqrt{29-4(1)}$$

$$-5 = \sqrt{25}$$

$$-5 = 5$$

$$7-6 = \sqrt{29-4(7)}$$

$$1 = 1 \checkmark$$

10) $\sqrt{4x-12} = (x-3)^2$

$$4x-12 = (x-3)(x-3)$$

$$4x-12 = x^2 - 6x + 9$$

$$0 = x^2 - 10x + 21$$

$$0 = (x-7)(x-3)$$

$x = 7$ $x = 3$

check

$$\sqrt{4(7)-12} = (7-3)^2$$

$$\sqrt{16} = 4$$

$$4 = 4 \checkmark$$

$$\sqrt{4(3)-12} = (3-3)^2$$

$$\sqrt{0} = 0$$

$$0 = 0 \checkmark$$

11) $\sqrt{3n-2} = n-2$

$$3n-2 = (n-2)^2$$

$$3n-2 = n^2 - 4n + 4$$

$$n^2 - 7n + 6 = 0$$

$$(n-6)(n-1) = 0$$

$n = 6$ $n = 1$

check

$$\sqrt{3(6)-2} = 6-2$$

$$\sqrt{16} = 4$$

$$4 = 4 \checkmark$$

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

$$1 = -1$$

12) $x = 3 + \sqrt{4x-16}$

$$-3 = -3$$

$$x-3 = \sqrt{4x-16}$$

$$x^2 - 6x + 9 = 4x - 16$$

$$x^2 - 10x + 25 = 0$$

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

$x = 5$

check

$$5 = 3 + \sqrt{4(5)-16}$$

$$5 = 3 + \sqrt{4}$$

$$5 = 3 + 2$$

$$5 = 5 \checkmark$$

Radical Equations - Day Two HW

Solve each equation. Remember to check for extraneous solutions.

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

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

2) $\sqrt{6-p} = p^2$
 $6-p = p^4$
 $p^4 + p - 6 = 0$
 $(p-2)(p+3) = 0$
 $p = 2$ ~~$p = -3$~~

check
 $\sqrt{6-2} = 2$
 $\sqrt{4} = 2$
 $2 = 2$

$\sqrt{6-(-3)} = -3$
 $\sqrt{9} = -3$
 ~~$3 = -3$~~

3) $\sqrt{-6+7x} = x$
 $-6+7x = x^2$
 $x^2 - 7x + 6 = 0$
 $(x-6)(x-1) = 0$
 $x = 6$ $x = 1$

check
 $\sqrt{-6+7(6)} = 6$
 $\sqrt{36} = 6$
 $6 = 6 \checkmark$
 $\sqrt{-6+7(1)} = 1$
 $\sqrt{1} = 1$
 $1 = 1 \checkmark$

4) $m = \sqrt{81}$
 $m = 9$

check
 $9 = \sqrt{81}$
 $9 = 9 \checkmark$

5) $\sqrt{10n} = n$
 $10n = n^2$
 $n^2 - 10n = 0$
 $n(n-10) = 0$
 $n = 0$ $n = 10$

check
 $\sqrt{10(0)} = 0$
 $0 = 0 \checkmark$
 $\sqrt{10(10)} = 10$
 $\sqrt{100} = 10$
 $10 = 10 \checkmark$

6) $\sqrt{20-x} = x$
 $20-x = x^2$
 $x^2 + x - 20 = 0$
 $(x-4)(x+5) = 0$
 $x = 4$ ~~$x = -5$~~

check
 $\sqrt{20-4} = 4$
 $\sqrt{16} = 4$
 $4 = 4 \checkmark$
 ~~$\sqrt{20-(-5)} = -5$~~
 ~~$5 = -5$~~

b+2	b+2
b ²	2b
2b	4

7) $b+2 = \sqrt{10-b}$
 $b^2 + 4b + 4 = 10 - b$
 $b^2 + 5b - 6 = 0$
 $(b-1)(b+6) = 0$
 $b = 1$ ~~$b = -6$~~

check
 $1+2 = \sqrt{10-1}$
 $3 = \sqrt{9}$
 $3 = 3 \checkmark$
 ~~$-6+2 = \sqrt{10-(-6)}$~~
 ~~$-4 = \sqrt{16}$~~
 ~~$-4 = 4$~~

x-4	x-4
x ²	-4x
-4x	16

8) $x = 4 + \sqrt{3x-8}$
 $x-4 = \sqrt{3x-8}$
 $x^2 - 8x + 16 = 3x - 8$
 $x^2 - 11x + 24 = 0$
 $(x-8)(x-3) = 0$
 $x = 8$ ~~$x = 3$~~

check
 $8-4 = \sqrt{3(8)-8}$
 $4 = \sqrt{16}$
 $4 = 4 \checkmark$
 ~~$3-4 = \sqrt{3(3)-8}$~~
 ~~$-1 = \sqrt{1}$~~
 ~~$-1 = 1$~~

n-1	n-1
n ²	-n
-n	1

9) $n-1 = \sqrt{-4n}$
 $n^2 - 2n + 1 = -4n$
 $n^2 + 2n + 1 = 0$
 $(n+1)(n+1) = 0$
 ~~$n = -1$~~

check
 ~~$-1-1 = \sqrt{-4(-1)}$~~
 ~~$-2 = \sqrt{4}$~~
 ~~$-2 = 2$~~

x	2
x ²	2x
2x	4

10) $(x+2)^2 = \sqrt{2x+3}$
 $x^2 + 4x + 4 = 2x + 3$
 $x^2 + 2x + 1 = 0$
 $(x+1)(x+1) = 0$
 $x = -1$

check
 ~~$(-1)+2 = \sqrt{2(-1)+3}$~~
 ~~$1 = \sqrt{1}$~~
 ~~$1 = 1 \checkmark$~~

No Solution

a-6	a-6
a ²	6a
-6a	36

11) $(a-6)^2 = \sqrt{3a-20}$
 $a^2 - 12a + 36 = 3a - 20$
 $a^2 - 15a + 56 = 0$
 $(a-7)(a-8) = 0$
 $a = 7$ $a = 8$

check
 ~~$7-6 = \sqrt{3(7)-20}$~~
 ~~$1 = \sqrt{1}$~~
 ~~$1 = 1 \checkmark$~~
 ~~$8-6 = \sqrt{3(8)-20}$~~
 ~~$2 = \sqrt{4}$~~
 ~~$2 = 2 \checkmark$~~

p-5	p-5
p ²	5p
5p	25

12) $\sqrt{4p-20} + 5 = p$
 $\sqrt{4p-20} = (p-5)^2$
 $4p-20 = p^2 - 10p + 25$
 $p^2 - 14p + 45 = 0$
 $(p-9)(p-5) = 0$

check
 ~~$\sqrt{4(9)-20} + 5 = 9$~~
 ~~$\sqrt{16} + 5 = 9$~~
 ~~$4 + 5 = 9$~~
 ~~$9 = 9 \checkmark$~~
 ~~$\sqrt{4(5)-20} + 5 = 5$~~
 ~~$\sqrt{0} + 5 = 5$~~
 ~~$5 = 5 \checkmark$~~