

## Solving Radical Equations

Date \_\_\_\_\_ Period \_\_\_\_\_

Solve each equation. Remember to check for extraneous solutions.

1)  $(\sqrt{\frac{k}{3}})^2 = (4)^2$

$$\frac{k}{3} = 16 \quad (3)$$

$$\boxed{k = 48}$$

Check:

$$\sqrt{\frac{48}{3}} = 4$$
$$\sqrt{16} = 4$$
$$4 = 4 \quad \checkmark$$

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

$$3x - 2 = x$$

$$2x - 2 = 0$$

$$2x = 2$$

$$\boxed{x = 1}$$

Check:

$$\sqrt{1} = \sqrt{1}$$

$$1 = 1 \quad \checkmark$$

3)  $\sqrt{2x} = 2$

4)  $1 = \sqrt{v-1}$

5)  $\sqrt{b-5} = 5$

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

$$r = 2r - 1$$

$$0 = r - 1$$

$$\boxed{1 = r} \quad \checkmark$$

Check:

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

$$1 = \sqrt{1}$$

$$1 = 1 \quad \checkmark$$

7)  $\sqrt{x-3} = 3$

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

$$(b+2)(b+2) = 2b+3$$

$$b^2 + 2b + 2b + 4 = 2b + 3$$

$$b^2 + 4b + 4 = 2b + 3$$

$$b^2 + 2b + 1 = 0$$

10)  $\sqrt{x} = 1$

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

$$b+1 = 0$$

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

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

$$r = 2r - 5$$

$$r + 5 = 2r$$

$$\boxed{5 = r} \quad \checkmark$$

$$\sqrt{5} = \sqrt{5}$$

$$11) x-1 = \sqrt{10-2x}$$

$$12) \sqrt{v-1} = \sqrt{3-v}$$

$$13) \sqrt{2x-9} = \sqrt{x-4}$$

You Try:

$$14) \sqrt{k} = 3$$

$$k = 9 \checkmark$$

You Try!

$$15) \sqrt{2x} = x$$

$$2x = x^2$$

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

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

$$x=0 \checkmark$$

$$x=2 \checkmark$$

$$17) (n-1)^2 = (\sqrt{2n-3})^2$$

$$(n-1)(n-1) = 2n-3$$

$$n^2 - n - n + 1 = 2n - 3$$

$$n^2 - 2n + 1 = 2n - 3$$

$$n^2 - 4n + 4 = 0$$

$$(n-2)(n-2) = 0$$

$$n=2 \checkmark$$

$$1=1 \checkmark$$

$$19) (n)^2 = (\sqrt{5n})^2$$

$$n^2 = 5n$$

$$n^2 - 5n = 0$$

$$n(n-5) = 0$$

$$n=0 \checkmark$$

$$n=5 \checkmark$$

$$\square : 0 \stackrel{?}{=} 0$$

$$\square : 5 \stackrel{?}{=} 5$$

You Try:

~~$$16) \sqrt{x+2} = \sqrt{3x+16}$$~~

$$x+2 = \sqrt{3x+16}$$

$$(x+2)(x+2) = 3x+16$$

$$x^2 + 2x + 2x + 4 = 3x + 16$$

$$x^2 + 4x + 4 = 3x + 16$$

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

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

$$18) x^{\frac{1}{2}} = (3x-10)^{\frac{1}{2}}$$

$$\sqrt{x} = \sqrt{3x-10}$$

~~$$x = -4$$~~

$$x = 3 \checkmark$$

extraneous solution

Check:

$$-2 \stackrel{?}{=} 2 \times$$

$$5 \stackrel{?}{=} 5 \checkmark$$

$$20) \sqrt{4n} = \sqrt{3n+1}$$