10-4 Radical Equations

Then

× + 4 \ 5. ×

You added, subtracted, and multiplied radical expressions.

Now

- Solve radical equations.
- Solve radical equations with extraneous solutions.



If you square both sides of a true equation, the resulting equation is still true. Words

If a = b, then $a^2 = b^2$. Symbols You must get the radical by itself!

Examples If $\sqrt{x} = 4$, then $(\sqrt{x})^2 = 4^2$.

check Your Understanding





Example 1 1. **GEOMETRY** The surface area of a basketball is x square inches. What is the radius of the basketball if the formula for the surface area of a sphere is $SA = 4\pi r^2$? $r = \frac{\sqrt{\pi x}}{2\pi}$

Examples 2–3 Solve each equation. Check your solution.

2.
$$\sqrt{10h} + 1 = 21$$
 40

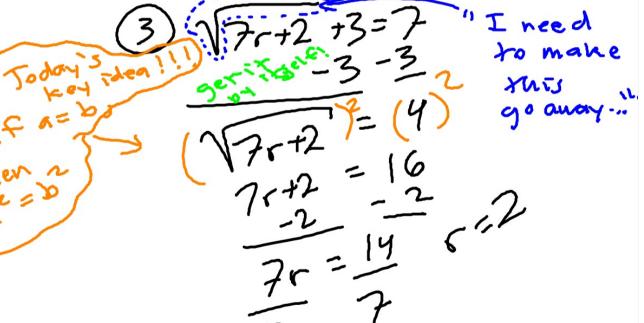
3.
$$\sqrt{7r+2}+3=7$$
 2

4.
$$5 + \sqrt{g - 3} = 6$$
 4

5.
$$\sqrt{3x-5}=x-5$$
 10

6.
$$\sqrt{2n+3} = n$$
 3

7.
$$\sqrt{a-2} + 4 = a$$
 6







Example 11. **GEOMETRY** The surface area of a basketball is x square inches. What is the radius of the basketball if the formula for the surface area of a sphere is $SA = 4\pi r^{2}$ the basketball if the formula for the surface area of a sphere is $SA = 4\pi r^2$? $r = \frac{\sqrt{\pi x}}{2\pi}$

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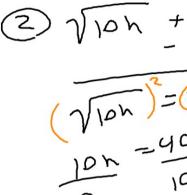
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$$\sqrt{a-2}+4=a$$
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$$3x-5 = x^{2}-10x+23$$

$$-3x+5 = x-13x+30$$

$$= x-13x+30$$

$$\int = (x - 3)(x - 10)$$

$$4.5 + \sqrt{g-3} = 6.4$$

$$-5 - 5$$

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

$$9 - 3 = 1$$

$$+3 + 3$$

$$= 4$$



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$$S = T \int \frac{9.71}{1.6}$$

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increase
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KeyConcept Power Property of Equality

If you square both sides of a true equation, the resulting equation is still true. Words

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

If $\sqrt{x} = 4$, then $(\sqrt{x})^2 = 4^2$. Examples

Examples 2-3 Solve each equation. Check your solution.

9
$$\sqrt{a} + 11 = 21$$
 100 10. $\sqrt{t} - 4 = 7$ **121 11.** $\sqrt{n-3} = 6$ **39**

10.
$$\sqrt{t} - 4 = 7$$
 121

11.
$$\sqrt{n-3}=6$$
 39

12.
$$\sqrt{c+10}=4$$
 6

12.
$$\sqrt{c+10} = 4$$
 6 13. $\sqrt{h-5} = 2\sqrt{3}$ **17 14.** $\sqrt{k+7} = 3\sqrt{2}$ **11**

14.
$$\sqrt{k+7} = 3\sqrt{2}$$
 11

15.
$$y = \sqrt{12 - y}$$
 3 16. $\sqrt{u + 6} = u$ **3 17.** $\sqrt{r + 3} = r - 3$ **6**

16.
$$\sqrt{u+6} = u$$
 3

17.
$$\sqrt{r+3} = r-3$$
 6

18.
$$\sqrt{1-2t}=1+t$$
 0

19.
$$5\sqrt{a-3}+4=14$$
 7

18.
$$\sqrt{1-2t} = 1+t$$
 0 19. $5\sqrt{a-3}+4=14$ **7 20.** $2\sqrt{x-11}-8=4$ **47**