HW 3.5

pp. 148

2 – 30 even

Tell whether the given value is a solution of the equation.

2. $2\sqrt{9x-1} = 20;\ 7$

$2\sqrt{9(7)-1} = 20$

$2\sqrt{63-1} = 20$

$2\sqrt{62} = 20$

$2\sqrt{2 \bullet 31} \neq 20$

no

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

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

$\sqrt{-7-2} = \sqrt{8+3}$

$\sqrt{-9} \neq \sqrt{11}$

no

6. $\sqrt{4x-3} = x-2;\ 7$

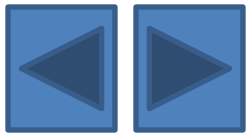
$\sqrt{4(7)-3} = 7-2$

$\sqrt{28-3} = 5$

$\sqrt{25} = 5$

$5 = 5$

yes



Describe **the steps you would use to solve the equation. Do not solve the equation.**

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

$6\sqrt{4-x}=4$ **Add 3 to both sides.**

$\sqrt{4-x}=\frac{4}{6}$ **Divide both sides by 6.**

$(\sqrt{4-x})^2=\left(\frac{2}{3}\right)^2$ **Square both sides & reduce fraction.**

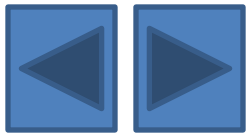
$4-x=\frac{4}{9}$ **Simplify**

$-x=\frac{4}{9}-4$ **Subtract 4 from both sides.**

$-x=\frac{4}{9}-\frac{36}{9}$ **Find common denominators.**

$-x=-\frac{32}{9}$ **Simplify.**

$x=\frac{32}{9}$ **Divide both sides by -1.**



Describe **the steps you would use to solve the equation. Do not solve the equation.**

10. $10\sqrt{6-x} = 2\sqrt{x+4}$

$5\sqrt{6-x} = \sqrt{x+4}$ **Divide both sides by 2.**

$\left(5\sqrt{6-x}\right)^2 = \left(\sqrt{x+4}\right)^2$ **Square both sides.**

$25(6-x) = x+4$ **Simplify.**

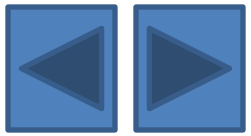
$150 - 25x = x + 4$ **Distribute.**

$150 = 26x + 4$ **Add 25x to both sides.**

$146 = 26x$ **Subtract 4 from both sides.**

$\frac{146}{26} = x$ **Divide both sides by 26.**

$\frac{73}{13} = x$ **Simplify.**



Describe **the steps you would use to solve the equation. Do not solve the equation.**

12. $\sqrt{9x+1}-2=x$

$\sqrt{9x+1}=x+2$

Add 2 to both sides.

$\left(\sqrt{9x+1}\right)^2=(x+2)^2$

Square both sides.

$9x+1=(x+2)(x+2)$

Factor.

$9x+1=x^2+2x+2x+4$

Simplify.

$9x+1=x^2+4x+4$

$-x^2+9x-4x+1-4=0$

Subtract x^2, 4x, and 4 from both sides.

$-x^2+5x-3=0$

Simplify.

$-(x^2-5x+3)=0$

Factor out a -1.

$-(x^2-5x+3)=0$

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

$\sqrt{x} = 20$

Add 4 to both sides.

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

Square both sides

$x = 400$

Simplify.

16. $\sqrt{x-6} - 2 = 4$

$\sqrt{x-6} = 6$

Add 2 to both sides.

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

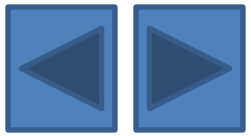
Square both sides.

$x - 6 = 36$

Simplify.

$x = 42$

Add 6 to both sides.



18. $\sqrt{8-3x}+5=6$

$\sqrt{8-3x}=1$

Subtract 5 from both sides.

$\left(\sqrt{8-3x}\right)^2=1^2$

Square both sides.

$8-3x=1$

Simplify.

$-3x=-7$

Subtract 8 from both sides.

$x=\frac{7}{3}$

Divide both sides by -3.

20. $3\sqrt{x+5}-3=6$

$3\sqrt{x+5}=9$

Add 3 to both sides.

$\sqrt{x+5}=3$

Divide both sides by 3.

$\left(\sqrt{x+5}\right)^2=3^2$

Square both sides.

$x+5=9$

Simplify.

$x=4$

Subtract 5 from both sides.

22. $\sqrt{x} = \sqrt{5x - 1}$

$\left(\sqrt{x}\right)^2 = \left(\sqrt{5x-1}\right)^2$ **Square both sides.**

$x = 5x - 1$ **Simplify.**

$-4x = -1$ **Subtract 5x from both sides.**

$x = \frac{1}{4}$ **Divide both sides by -4.**

24. $\sqrt{6x - 8} = \sqrt{4x - 10}$

$\left(\sqrt{6x-8}\right)^2 = \left(\sqrt{4x-10}\right)^2$ **Square both sides.**

$6x - 8 = 4x - 10$ **Simplify.**

$2x - 8 = -10$ **Subtract 4x from both sides.**

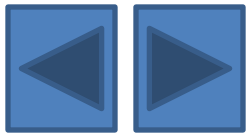
$2x = -2$ **Add 8 to both sides.**

$x = -1$ **Divide both sides by 2.**

$\sqrt{6(-1) - 8} = \sqrt{4(-1) - 10}$

$\sqrt{-14 - 8} = \sqrt{-4 - 10}$

$\sqrt{-22} \neq \sqrt{-14}$



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

$\sqrt{x-15}=\sqrt{x-7}$ **Add $\sqrt{x}$-7 to both sides.**

$\left(\sqrt{x-15}\right)^2=\left(\sqrt{x-7}\right)^2$ **Square both sides.**

$x-15=x-7$ **Simplify.**

$-15\neq -7$ **No solutions**

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

$\left(\sqrt{5x-6}\right)^2=x^2$

Square both sides.

$5x-6=x^2$

Simplify.

$-x^2+5x-6=0$

Subtract x^2 from both sides.

$-(x^2-5x+6)=0$

Factor out a -1.

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

Factor.

$x-2=0$

$x=2$

$\sqrt{5(2)-6}=2$

$\sqrt{10-6}=2$

$\sqrt{4}=2$

$2=2$

$x-3=0$

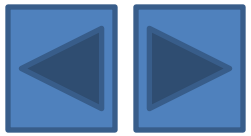
$x=3$

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

$\sqrt{15-6}=3$

$\sqrt{9}=3$

$3=3$



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

$\left(\sqrt{2x-15}\right)^2=x^2$ **Square both sides.**

$2x-15=x^2$ **Simplify.**

$-x^2+2x-15=0$ **Subtract x^2 from both sides.**

$-(x^2-2x+15)=0$ **Factor out a -1.**

No solutions.