

Key

Solving Radical Equations Practice

1. $\sqrt[3]{5-11x} = 3$
 $(5-11x)^{1/3} = 3$
 $5-11x = 3^3 = 27$
 $-11x = 22$
 $x = -2$

$\sqrt[3]{5-11(-2)} = 3$
 $\sqrt[3]{5+22} = 3$
 $\sqrt[3]{27} = 3$
 $3 = 3 \checkmark$

2. $\sqrt{2x+15} = x+6$
 $(2x+15)^{1/2} = x+6$
 $2x+15 = (x+6)^2$
 $2x+15 = x^2+12x+36$
 $0 = x^2+10x+21$
 $(x+7)(x+3) = 0$
 $x = -7, x = -3$
 $x = -7$ extraneous
 $x = -3$ ✓

$\sqrt{-7+15} = -7+6$
 $\sqrt{1} = -1$
 $1 = -1$ No

$\sqrt{-3+15} = -3+6$
 $\sqrt{12} = 3$
 $3 = 3 \checkmark$

3. $\sqrt{10-3x} = \sqrt{x+2}$
 $(10-3x)^{1/2} = (x+2)^{1/2}$
 $10-3x = x+2$
 $8 = 4x$
 $x = 2$

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

4. $(12-x)^{3/2} + 10 = 9$
 $(12-x)^{3/2} = -1$
 $12-x = (-1)^{2/3}$
 $12-x = (-1)^{2/3} = (-1)^2$
 $12-x = 1$
 $x = 11$ extraneous
 $(12-11)^{3/2} + 10 = 9$
 $(1)^{3/2} + 10 = 9$
 $1+10 = 9$
 $11 = 9$ No
 $x = 11$ No Solution

5. $\sqrt{3x+19} = x-3$
 $(3x+19)^{1/2} = x-3$
 $3x+19 = (x-3)^2$
 $3x+19 = x^2-6x+9$
 $0 = x^2-9x-10$
 $(x-10)(x+1) = 0$
 $x = 10, x = -1$
 $x = -1$ extraneous
 $x = 10$ ✓

$\sqrt{30+19} = 10-3$
 $\sqrt{49} = 7$
 $7 = 7 \checkmark$

$x = -1 \rightarrow$
 $\sqrt{-3+19} = -1-3$
 $\sqrt{16} = -4$
 $4 = -4$ No

6. $(x-5)^{3/2} = 8$
 $(x-5) = 8^{2/3}$
 $x-5 = (2^3)^{2/3} = 2^2$
 $x-5 = 4$
 $x = 9$
 $(9-5)^{3/2} = 8$
 $4^{3/2} = 8$
 $(2^2)^{3/2} = 8$
 $2^3 = 8 \checkmark$

7. $\sqrt{13-x} + x = 7$
 $(13-x)^{1/2} + x = 7$
 $(13-x)^{1/2} = 7-x$
 $13-x = 49-14x+x^2$
 $0 = 36-13x+x^2$
 $0 = x^2-13x+36$
 $0 = (x-9)(x-4)$
 $x = 9, x = 4$
 $x = 9$ is extraneous
 $x = 4$ ✓

$x = 9$
 $\sqrt{13-9} + 9 = 7$
 $\sqrt{4} + 9 = 7$
 $2+9 = 7$
 $11 = 7$ No

$x = 4$
 $\sqrt{13-4} + 4 = 7$
 $\sqrt{9} + 4 = 7$
 $3+4 = 7$
 $7 = 7 \checkmark$

8. $\sqrt[3]{x^2-1} = 2$
 $(x^2-1)^{1/3} = 2$
 $x^2-1 = 2^3 = 8$
 $x^2-9 = 0$
 $(x-3)(x+3) = 0$
 $x = 3, x = -3$
 $x = 3$ ✓
 $x = -3$ ✓

$x = 3$
 $\sqrt[3]{3^2-1} = 2$
 $\sqrt[3]{9-1} = 2$
 $\sqrt[3]{8} = 2 \checkmark$

$x = -3$
 $\sqrt[3]{(-3)^2-1} = 2$
 $\sqrt[3]{9-1} = 2$
 $\sqrt[3]{8} = 2 \checkmark$

9 is extraneous