Name: Key

10-4 Practice *Radical Equations*

Solve each equation. Check your solution.

1. $(\sqrt{-b})^2 = (8)^2$

$-b = 64$

$\boxed{b = -64}$

$8 = 8$ ✓

2. $(4\sqrt{3})^2 = (\sqrt{x})^2$

$16(3) = x$

$\boxed{48 = x}$

$4\sqrt{3} = 4\sqrt{3}$ ✓

3. $2\sqrt{4r} + 3 = 11$

$(\sqrt{4r})^2 = (4)^2$

$4r = 16$

$\boxed{r = 4}$

$11 = 11$ ✓

4. $6 - \sqrt{2y} = -2$

$(\sqrt{2y})^2 = (8)^2$

$2y = 64$

$\boxed{y = 32}$

$-2 = -2$ ✓

5. $(\sqrt{m - 5})^2 = (4\sqrt{3})^2$

$m - 5 = 16(3)$

$\boxed{m = 53}$

$4\sqrt{3} = 4\sqrt{3}$ ✓

6. $(\sqrt{5m - 16})^2 = (m - 2)^2$

$5m - 16 = m^2 - 4m + 4$

$0 = m^2 - 9m + 20$

$0 = (m-4)(m-5)$

$\boxed{5, 4}$

$3 = 3$ ✓ $2 = 2$ ✓

7. $(\sqrt{6t + 12})^2 = (8\sqrt{6})^2$

$6t + 12 = 64(6)$

$6t = 372$

$\boxed{t = 62}$

$8\sqrt{6} = 8\sqrt{6}$

8. $\sqrt{3j - 11} + 2 = 9$

$-2 \quad -2$

$3j - 11 = 49$

$\frac{3j}{3} = \frac{60}{3}$

$\boxed{j = 20}$

$9 = 9$ ✓

9. $6\sqrt{\frac{3x}{3}} - 3 = 0$

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

$\frac{3x}{3} = \frac{1}{4}$

$\frac{12x}{12} = \frac{3}{12}$

$\boxed{x = \frac{1}{4}}$

$0 = 0$ ✓

10. $6 + \sqrt{\frac{5r}{6}} = -2$

$\left(\sqrt{\frac{5r}{6}}\right)^2 = (-8)^2$

$\frac{5r}{6} = 64$

$\cancel{5}r = \frac{384}{\cancel{5}}$

$r = \cancel{76}.8$ Extraneous

$14 \neq -2$

11. $\sqrt{10p + 61} - 7 = p$

$\left(\sqrt{10p + 61}\right)^2 = (p + 7)^2$

$10p + 61 = p^2 + 14p + 49$

$0 = p^2 + 4p - 12$

$0 = (p + 6)(p - 2)$

$\boxed{-\cancel{6}, 2}$

$\sqrt{\ } = \#$ $\qquad 2 \overset{\checkmark}{=} 2$

12. $\left(\sqrt{2x^2 - 9}\right)^2 = (x)^2$

$2x^2 - 9 = x^2$

$x^2 = 9$

$\boxed{\pm 3}$

-3 is extraneous

$\boxed{3 \overset{\checkmark}{=} 3}$

$\boxed{3 \neq -3}$

13. Assuming no air resistance, the time t in seconds that it takes an object to fall h feet can be determined by the equation $t = \frac{\sqrt{h}}{4}$.

a. If a skydiver jumps from an airplane and free falls for 10 seconds before opening the parachute, how many feet does the skydiver fall?

b. Suppose a second skydiver jumps and free falls for 6 seconds. How many feet does the second skydiver fall?

a)

$10 = \frac{\sqrt{h}}{4}$

$40 = \sqrt{h}$

$1600 = h$

$\boxed{1{,}600 \text{ ft}}$

$6 = \frac{\sqrt{h}}{4}$

$24 = \sqrt{h}$

$576 = h$

$\boxed{576 \text{ ft}}$