Solve Radical Equations

Solve each radical equation. Be sure to check your solutions.

a) $\sqrt{x} - 6 = 4$

b) $\sqrt[3]{x} - 6 = 4$

c) $\sqrt{x} + 6 = 4$

d) $\sqrt[3]{x} + 6 = 4$

e) $\sqrt{3x + 5} - 2 = -1$

f) $3\sqrt{6 - x} + 4 = -8$

Solve Radical Equations

Solve each radical equation. Be sure to check your solutions.

a) $\sqrt{x} - 6 = 4$

$\sqrt{x} = 10$

$x = 100$

Check: $\sqrt{100} - 6 = 10 - 6 = 4$

So 100 *is a valid solution.*

b) $\sqrt[3]{x} - 6 = 4$

$\sqrt[3]{x} = 10$

$x = 1000$

Check: $\sqrt[3]{1000} - 6 = 10 - 6 = 4$

So $1{,}000$ *is a valid solution.*

c) $\sqrt{x} + 6 = 4$

$\sqrt{x} = -2$

$x = 4$

Check: $\sqrt{4} + 6 = 2 + 6 = 8$, and $8 \neq 4$, so 4 is not a valid solution.

d) $\sqrt[3]{x} + 6 = 4$

$\sqrt[3]{x} = -2$

$x = -8$

Check: $\sqrt[3]{-8} + 6 = -2 + 6 = 4$, so -8 is a valid solution.

e) $\sqrt{3x + 5} - 2 = -1$

$\sqrt{3x + 5} = 1$

$3x + 5 = 1$

$3x = -4$

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

Check: $\sqrt{3\left(-\frac{4}{3}\right) + 5} - 2 = \sqrt{-4 + 5} - 2 = \sqrt{1} - 2 = -1$, *so* $-\frac{4}{3}$ *is a valid solution.*

f) $3\sqrt{6 - x} + 4 = -8$

$3\sqrt{6 - x} = -12$

$\sqrt{6 - x} = -4$

$6 - x = 16$

$x = -10$

Check: $3\sqrt{6 - (-10)} + 4 = 3\sqrt{16} + 4 = 3(4) + 4 = 16$, and $\neq -8$, *so* -10 *is not a valid solution.*