

4) Solve

c) $3(x-2)^{\frac{3}{4}} = 24$

$$\frac{3r}{3} = \frac{24}{3}$$

$$(x-2)^{\frac{3}{4}} = (8)^{\frac{4}{3}}$$

$$\begin{array}{r} x-2 = 16 \\ +2 \quad +2 \\ \hline x = 18 \end{array}$$

$3(18-2)^{\frac{3}{4}} = 24$ ✓

d) $(x+1)^{\frac{3}{2}} - 2 = 25$

$$\begin{array}{r} +2 \quad +2 \\ \hline ((x+1)^{\frac{3}{2}})^{\frac{2}{3}} = 27^{\frac{2}{3}} \\ x+1 = 9 \end{array}$$

$x = 8$

Sometimes you end up with a quadratic, so you need to check for extraneous solutions!

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

$$\begin{array}{r} -3 \quad -3 \\ \hline \sqrt{5x-1}^2 = (x-3)^2 \\ 5x-1 = x^2 - 6x + 9 \end{array}$$

$x = 10$

 ~~$x = 1$~~

g) $(x+3)^{\frac{1}{2}} - 1 = x$

$$\begin{array}{r} +1 \quad +1 \\ \hline ((x+3)^{\frac{1}{2}})^2 = (x+1)^2 \\ x+3 = x^2 + 2x + 1 \end{array}$$
 ~~$x = 2$~~

$x = 1$

f) $\sqrt{-3x-5} = (x+3)^2$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$-3x-5 = (x+3)(x+3)$$

$$\begin{array}{r} -3x-5 = x^2 + 6x + 9 \\ +3x+5 \quad +3x+5 \\ \hline 0 = x^2 + 9x + 14 \end{array}$$

$$x = \frac{-9 \pm \sqrt{9^2 - 4(1)(14)}}{2(1)}$$

$$0 = (x+2)(x+7)$$

$\begin{array}{r} 2x \\ +7x \\ \hline 9x \end{array}$

$$\begin{array}{r} x+2=0 \\ -2 \quad -2 \\ \hline x = -2 \end{array}$$

$$\begin{array}{r} x+7=0 \\ -7 \quad -7 \\ \hline x = -7 \end{array}$$

$\sqrt{-3(-2)-5} \stackrel{?}{=} -2+3$
 $\sqrt{6-5} \stackrel{?}{=} -2+3$
 $\sqrt{1} = 1 \checkmark$

$\sqrt{-3(-7)-5} \stackrel{?}{=} -7+3$
 $\sqrt{21-5} \stackrel{?}{=} -4$
 $\sqrt{16} \neq -4$

EXTRANEUS SOLUTION

Summary: