

Example 7

Solve $\sqrt{3x + 2} - 2\sqrt{x} = 0.$

$+2\sqrt{x} \quad +2\sqrt{x}$

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

$2^2 = 2 \cdot 2$

$$3x + 2 = 4x$$

$$-3x \quad -3x$$

$$\boxed{2 = x}$$



Example 8

Solve $\sqrt{4x + 28} - 3\sqrt{2x} = 0.$

$+3\sqrt{2x}$ $+3\sqrt{2x}$

$$\left(\sqrt{4x+28}\right)^2 = \left(3\sqrt{2x}\right)^2$$

$3^2 = 3 \cdot 3$

$$4x + 28 = 9 \cdot 2x$$

$$4x + 28 = 18x$$

$-4x$ $-4x$

$$\frac{28}{14} = \frac{14x}{14}$$

$$x = 2$$



Example 9

Solve $(x - 4)^2 = (\sqrt{2x})^2$

$(x-4)(x-4)$

$$x^2 - 4x - 4x + 16 = 2x$$

$$x^2 - 8x + 16 = 2x$$

$-2x$ $-2x$

$$1x^2 - 10x + 16 = 0$$

$$(x-8)(x-2) = 0$$

$$x-8=0$$

$+8$ $+8$

$$x=8$$

$$x-2=0$$

$+2$ $+2$

~~$$x=2$$~~

$$x=8: 8-4 = \sqrt{2 \cdot 8}$$

$$4 = \sqrt{16}$$

$$4 = 4 \checkmark$$

$$x=2: 2-4 = \sqrt{2 \cdot 2}$$

$$-2 = \sqrt{4}$$

$$-2 = 2 \times$$

Sum -10	prod. 16
-8 + -2	-8 · -2

$\frac{-8}{1}$	$\frac{-2}{1}$
(1x-8)	(1x-2)

extraneous solution

Example 10

Solve $(x+2)^2 = \sqrt{2x+28}$.

$(x+2)(x+2)$

$x = -6: -6+2 = \sqrt{2 \cdot -6 + 28}$
 $-4 = \sqrt{-12+28}$

$-4 = \sqrt{16}$
 $-4 = 4$ X

$x = 4: 4+2 = \sqrt{2 \cdot 4 + 28}$
 $6 = \sqrt{8+28}$
 $6 = \sqrt{36}$
 $6 = 6$ ✓

$$x^2 + 2x + 2x + 4 = 2x + 28$$

$$x^2 + 4x + 4 = 2x + 28$$

$-2x$ $-2x$

$$x^2 + 2x + 4 = 28$$

-28 -28

$$1x^2 + 2x - 24 = 0$$

$$(x+6)(x-4) = 0$$

$x+6=0$
 -6 -6

~~$x = -6$~~

$x-4=0$
 $+4$ $+4$

$x = 4$

sum 2	prod. -24
6 + -4	6 · -4

$\frac{6}{1}$	$\frac{-4}{1}$
$(1x+6)$	$(1x-4)$

extraneous solution