HW Review   p. 732

⑬ $\left(2\sqrt{x-11}\right) - 8 = 4 + 8$

$+8$

$$\frac{2\sqrt{x-11}}{2} = \frac{12}{2}$$

$$\left(\sqrt{x-11}\right)^2 = 6^2$$

$x - 11 = 36 + 11$

$+11$

$x = 47$

24) $\left(\sqrt{11x-24}\right)^2 = x^2$

$11x-24 = x^2 - 11x + 24$
$-11x + 24$

$x^2 - 11x + 24 = 0$

$(x-8)(x-3)$

$x - 8 = 0 \qquad x - 3 = 0$

$\boxed{x = 8 \qquad x = 3}$

$\sqrt{11(8)-24} = 8$

$\sqrt{88-24} = 8$

$\sqrt{64} = 8$

$8 = 8 \checkmark$

$\sqrt{11(3)-24} = 3$

$\sqrt{33-24} = 3$

$\sqrt{9} = 3$

$3 = 3 \checkmark$

$$\text{31} \quad \left(\sqrt{x} + 2\right)^2 = \left(\sqrt{x-1}\right)^2$$

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

$$x + 2\sqrt{x} + 2\sqrt{x} + 4 = x - 1$$

$$x + 4\sqrt{x} + 4 = x - 1$$
$$-x \qquad\qquad -4 \;-x\; -4$$

$$\frac{4\sqrt{x}}{4} = \frac{-5}{4}$$

no solution

$$\sqrt{x} = \frac{-5}{4}$$

3

㉜ $\left(2-\sqrt{x+1}\right)^2=\left(\sqrt{x+3}\right)^2$

$\left(2-\sqrt{x+1}\right)\left(2-\sqrt{x+1}\right)=x+3$

$4-2\sqrt{x+1}-2\sqrt{x+1}+(x+1)=x+3$
$-4 \qquad\qquad\qquad -x-1 \quad -x-4$
$\qquad\qquad\qquad\qquad\qquad\qquad -1$

$$\frac{-4\sqrt{x+1}}{-4}=\frac{-2}{-4}$$

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

$$x+1=\frac{1}{4}-\frac{4}{4}$$
-1

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

4

(33) $\sqrt{5x+9} + \sqrt{5x} = 9 - \sqrt{5x}$

$\qquad\qquad -\sqrt{5x}$

$\left(\sqrt{5x+9}\right)^2 = \left(9 - \sqrt{5x}\right)\left(9 - \sqrt{5x}\right)$

$5x + 9 = 81 - 9\sqrt{5x} - 9\sqrt{5x} + 5x$

$-5x \quad -81 \quad -81 \qquad\qquad\qquad -5x$

$$\frac{-72}{-18} = \frac{-18\sqrt{5x}}{-18}$$

$(4)^2 = \left(\sqrt{5x}\right)^2$

$$\frac{16}{5} = \frac{5x}{5}$$

$\boxed{x = \dfrac{16}{5}}$

5

⑪ $\sqrt{6-2x} + 12 = 21$

$\phantom{\sqrt{6-2x}} \quad -12 \quad -12$

$(\sqrt{6-2x})^2 = 9^2$

$6 - 2x = 81$

$-6 -6$

$\dfrac{-2x}{-2} = \dfrac{75}{-2}$

$x = \dfrac{-75}{2}$

$\sqrt{6 - 2\left(\frac{-75}{2}\right)} + 12 = 21$

$\sqrt{6 + 75} + 12 = 21$

$\sqrt{81} + 12 = 21$

$9 + 12 = 21$

$21 = 21 \checkmark$

$$\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$a\sqrt{x} + b\sqrt{x} = (a+b)\sqrt{x}$$

$$\sqrt{64x} = \sqrt{64} \cdot \sqrt{x} = 8\sqrt{x}$$

$$\sqrt{128} = \sqrt{2 \cdot 64} = \sqrt{2} \cdot \sqrt{64} = \sqrt{2} \cdot 8$$
$$= 8\sqrt{2}$$

$$\sqrt{\frac{16x^2}{200}} = \frac{\sqrt{16x^2}}{\sqrt{200}} = \frac{\sqrt{16} \cdot \sqrt{x^2}}{\sqrt{2 \cdot 100}} = \frac{4x}{\sqrt{2} \cdot \sqrt{100}} =$$

$$\boxed{\frac{4x}{10\sqrt{2}}}$$

"rationalize the denominator": get rid of radicals in the denom.

$$\frac{4x}{10\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{4x\sqrt{2}}{10 \cdot 2} = \frac{4x\sqrt{2}}{20\,5}$$

$$\boxed{\frac{x\sqrt{2}}{5}}$$

Simplify the expression.

$\sqrt{14}\sqrt{8}$ $\sqrt{56}\sqrt{2}$

1. $\sqrt{200}$

$\sqrt{100\cdot 2}$

$\sqrt{100}\cdot\sqrt{2}$

$10\sqrt{2}$

2. $\sqrt{45}$

$\sqrt{9\cdot 5}$

$\sqrt{9}\cdot\sqrt{5}$

$3\sqrt{5}$

3. $\sqrt{112}$

$\sqrt{16}\ \sqrt{7}$

$4\sqrt{7}$

4. $\sqrt{400d}$

$\sqrt{400}\ \sqrt{d}$

$20\sqrt{d}$

5. $\sqrt{9y^2}$

$\sqrt{9}\ \sqrt{y^2}$

$3y$

6. $\sqrt{25n^3}$

$\sqrt{25\cdot n^2\cdot n}$

$\sqrt{25}\cdot\sqrt{n^2}\cdot\sqrt{n}$

$5n\sqrt{n}$

HW   p.723   3-21 (odd)
     p.755   17-22 (all)