Alg 2: Homework 33

① $y - 2 = \sqrt{y}$

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

$y^2 - 4y + 4 = y$

$y^2 - 5y + 4 = 0$

$(y-4)(y-1) = 0$

$y - 4 = 0$ v $y - 1 = 0$

$y = 4$ v $y = 1$

Check ($y=4$): $4 - 2 \stackrel{?}{=} \sqrt{4}$, $2 = 2$ ✓

Check ($y=1$): $1 - 2 \stackrel{?}{=} \sqrt{1}$, $-1 \neq 1$, reject $y = 1$

$\{4\}$

② $5 + \sqrt{4y-3} = 2$

$-5 \qquad -5$

$\sqrt{4y-3} = -3$

$\{\}$

③ $2\sqrt{y+7} - \sqrt{y+25} = 0$

$2\sqrt{y+7} = \sqrt{y+25}$

$(2\sqrt{y+7})^2 = (\sqrt{y+25})^2$

$4(y+7) = y + 25$

$4y + 28 = y + 25$

$3y = -3$

$y = -1$

Check

$2\sqrt{-1+7} - \sqrt{-1+25} \stackrel{?}{=} 0$

$2\sqrt{6} - \sqrt{24} \stackrel{?}{=} 0$

$2\sqrt{6} - \sqrt{4}\sqrt{6} \stackrel{?}{=} 0$

$2\sqrt{6} - 2\sqrt{6} \stackrel{?}{=} 0$

$0 = 0$ ✓

$\{-1\}$

(4) $x^2 - 6x + 8 = 0$

$-8 \quad -8$

$x^2 - 6x \quad = -8$

$x^2 - 6x \boxed{+9} = -8 \boxed{+9}$

$\sqrt{(x-3)^2} = \pm\sqrt{1}$

$x - 3 = \pm 1$

$x - 3 = 1 \quad \vee \quad x - 3 = -1$

$x = 4 \quad \vee \quad x = 2$ $\boxed{\{2, 4\}}$

(5) $x^2 - 4x = 7$

$x^2 - 4x \boxed{+4} = 7 \boxed{+4}$

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

$x - 2 = \pm\sqrt{11}$

$x - 2 = \sqrt{11} \quad \vee \quad x - 2 = -\sqrt{11}$

$x = 2 + \sqrt{11} \quad \vee \quad x = 2 - \sqrt{11}$

$\boxed{\{2 + \sqrt{11}, \quad 2 - \sqrt{11}\}}$

(6) $\frac{4}{\sqrt{12}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{3}}{\sqrt{36}} = \frac{\overset{2}{\cancel{4}}\sqrt{3}}{\underset{3}{\cancel{6}}} = \boxed{\frac{2\sqrt{3}}{3}}$

(7) $\frac{(\sqrt{5} - \sqrt{7})}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}}$

$= \boxed{\frac{5 - \sqrt{35}}{5}}$

(8) $\frac{6}{(\sqrt{5}+2)} \cdot \frac{(\sqrt{5}-2)}{(\sqrt{5}-2)}$

$= \frac{6(\sqrt{5}-2)}{5-4} = \frac{6(\sqrt{5}-2)}{1} = \boxed{6\sqrt{5} - 12}$

(9) $\frac{(3+\sqrt{2})}{(\sqrt{2}-5)} \cdot \frac{(\sqrt{2}+5)}{(\sqrt{2}+5)}$

$= \frac{3\sqrt{2} + 15 + 2 + 5\sqrt{2}}{2 - 25}$

$= \boxed{\frac{17 + 8\sqrt{2}}{-23}}$