College Algebra: Problem Set 9 Solving radical and quadratic in form equations

Solve.

1. $x-\sqrt{x}-2=0$

2. $\sqrt{x+9}=2\sqrt{x-3}$

3. $2\sqrt{6-x}=x-3$

4. $x^4-13x^2+36=0$

5. $(w+2)^2-3(w+2)-4=0$

6. $(m-6)^{2/3}+5(m-6)^{1/3}=-4$

Solutions to Odd Problems.

1.

$$x-\sqrt{x}-2=0$$
$$x-2=\sqrt{x}$$
$$(x-2)^2=(\sqrt{x})^2$$
$$x^2-4x+4=x$$
$$x^2-5x+4=0$$
$$(x-4)(x-1)=0$$
$$x=4 \quad or \quad x=1$$
$$Check: \quad 4-\sqrt{4}-2=0$$
$$1-\sqrt{1}-2\neq 0$$
$$x=4$$

3.

$$2\sqrt{6-x}=x-3$$
$$\left(2\sqrt{6-x}\right)^2=(x-3)^2$$
$$4(6-x)=x^2-6x+9$$
$$24-4x=x^2-6x+9$$
$$0=x^2-2x-15$$
$$0=(x-5)(x+3)$$
$$x=5 \quad or \quad x=-3$$
$$Check: \quad 2\sqrt{6-5}=5-3$$
$$2\sqrt{6-(-3)}\neq -3-3$$
$$x=5$$

5.

$$(w+2)^2-3(w+2)-4=0$$
$$Let \quad u=w+2$$
$$u^2-3u-4=0$$
$$(u-4)(u+1)=0$$
$$u=4 \quad or \quad u=-1$$
$$w+2=4 \quad or \quad w+2=-1$$
$$w=2 \quad w=-3$$

Answers to Even Problems

2. $x=7$ 4. $x=\pm 2, \pm 3$ 6. $m=-58, 5$