1. Resol les següents equacions, sense utilitzar la fórmula:

a) $x^2 - 16 = 0$ b) $x^2 - 36 = 0$ c) $x^2 - 100 = 0$ d) $x^2 - 324 = 0$

e) $x^2 - 13 = 0$ f) $3x^2 + 12x = 0$ g) $5x^2 - 10x = 0$ h) $2x^2 + 18x = 0$

i) $-3x^2 + 2x = 0$ j) $5x^2 - 25x = 0$ k) $-3x^2 + 15x = 0$ l) $\left(20 - \frac{x}{6}\right)\left(10 - \frac{3x}{4}\right) = 0$

2. Resol les equacions següents:

a) $x^4 - 3x^2 + 2 = 0$ b) $x^4 = 10x^2 - 25$ c) $2x^4 + 6 = 8x^2$

d) $2x^4 - 4x^2 - 2 = 0$ e) $-2x^4 + 12x^2 - 16 = 0$

3. Resol la següent equació:

$$\frac{x_2 - 5x + 4}{8 - x} = 5$$

4. Resol les següents equacions i recorda que has de comprovar les solucions obtingudes:

a) $x - 2 = \sqrt{x}$

b) $\sqrt{\sqrt{x+2}} = 14$

c) $\sqrt{\sqrt{x-1}+1} = 2$

d) $\sqrt{x+1} + \sqrt{x-2} = 3$

e) $\sqrt{x+2} = x - 4$

f) $\sqrt{x+5} + \sqrt{3} = \sqrt{x+7}$

g) $\sqrt{x+5} = 1 + \sqrt{x}$

h) $\sqrt{4x+5} - \sqrt{5x-9} = \sqrt{x-4}$

5. Resol els següents sistemes d'equacions:

a) $\begin{cases} 3x + 5 = 2y - 8 \\ 2y - 3 = 4x + 1 \end{cases}$

b) $\begin{cases} x + 3(y-2) = 5 \\ (x-2)(y+3) = (x+4)(y-1) \end{cases}$

c) $\begin{cases} \frac{y+5}{3} + \frac{x-1}{2} = 5 \\ \frac{y+6}{5} + \frac{x-3}{2} = 3 \end{cases}$

d) $\begin{cases} \frac{x-2}{4} - \frac{3(y-1)}{2} = -4 \\ 3(x-3) = 5y - 4 \end{cases}$

e) $\begin{cases} \frac{8x-4}{3} - \frac{4y-2}{2} = -7 \\ 2 - \frac{x+2}{2} = \frac{2y-1}{2} \end{cases}$

f) $\begin{cases} x + y = 7 \\ xy = 12 \end{cases}$

g) $\begin{cases} x + y = 10 \\ xy = 16 \end{cases}$

h) $\begin{cases} x^2 + 3xy + y^2 = 31 \\ xy = 6 \end{cases}$

i) $\begin{cases} x + y + xy = 14 \\ x + y = 6 \end{cases}$

j) $\begin{cases} x^2 - y^2 = 640 \\ \frac{x}{y} = \frac{7}{3} \end{cases}$

6. Resol els següents sistemes:

1) $\begin{cases} 2x + y = 10 \\ x^2 - y^2 = 12 \end{cases}$ 2) $\begin{cases} x + y = 6 \\ x^2 + y^2 = 16 \end{cases}$ 3) $\begin{cases} x - y = 2 \\ x^2 + y^2 = 20 \end{cases}$ 4) $\begin{cases} 3x - 2y = 6 \\ 2x^2 - y^2 = 23 \end{cases}$

5) $\begin{cases} 2x + y = -6 \\ 2xy = -40 \end{cases}$ 6) $\begin{cases} x - 2y = 7 \\ x^2 - y = 26 \end{cases}$ 7) $\begin{cases} 3x + y - 5 = 0 \\ x^2 + y^2 - xy = 3 \end{cases}$ 8) $\begin{cases} x + y = 12 \\ x + y - xy = -8 \end{cases}$

9) $\begin{cases} x^2 + y^2 = 41 \\ x^2 - y^2 = 9 \end{cases}$ 10) $\begin{cases} x^2 + y^2 = 5 \\ x^2 - y^2 = 3 \end{cases}$ 11) $\begin{cases} 3x^2 + y^2 = 124 \\ 2x^2 + 3y^2 = 120 \end{cases}$ 12) $\begin{cases} \dfrac{3x^2 + 2y^2}{4} = \dfrac{7}{4} \\ x^2 + y^2 = 3 \end{cases}$

13) $\begin{cases} x^2 + y^2 = 34 \\ xy = 15 \end{cases}$ 14) $\begin{cases} x^2 + y^2 = 15 \\ 2xy = 12 \end{cases}$ 15) $\begin{cases} x^2 + y^2 = 26 \\ xy = 5 \end{cases}$ 16) $\begin{cases} x^2 + y^2 = 40 \\ 5xy = 60 \end{cases}$

17) $\begin{cases} x^2 + y^2 = 50 \\ x^2 + xy = 56 \end{cases}$ 18) $\begin{cases} 2x^2 + y^2 = 33 \\ y^2 - xy = 15 \end{cases}$ 19) $\begin{cases} x^2 + y^2 = 41 \\ x^2 - xy = -4 \end{cases}$ 20) $\begin{cases} x^2 - 2xy - y^2 = 41 \\ x^2 + 3xy - y^2 = 131 \end{cases}$

21) $\begin{cases} xy - x - y = 0 \\ 3xy - 2x - 2y = 4 \end{cases}$

Solucions:

1. a) *x=4, x=-4* b) *x=6, x=-6* c) *x=10, x=-10* d) *x=18, x=-18* e) $x = \sqrt{13}, \quad x = -\sqrt{13}$

f) *x=0, x=-4* g) *x=0, x=2* h) *x=0, x=-9* i) *x=0,* $x = \dfrac{2}{3}$ j) *x=0, x=5* k) *x=0, x=-8*

l) *x=120,* $x = \dfrac{40}{3}$.

2. a) $x = \pm\sqrt{2} \quad x = \pm 1$ b) $x = \pm 5$ c) $x = \pm\sqrt{3} \quad x = \pm 1$ d) $x = \pm\sqrt{1+\sqrt{2}}$ e) $x = \pm 2 \quad x = \pm\sqrt{2}$

3. $x = \pm 6$

4. a) *x=4, x=1* b) *x=38414* c) *x=10* d) *x=3* e) *x=7* f) *No té solució* g) *x=4* h) $x = 5 \quad x = -\dfrac{9}{4}$

5. a) *x=9, y=20* b) *x=4,* $y = \dfrac{7}{3}$ c) *x=5, y=4* d) *x=10, y=5* e) *x=-1, y=2* f) $\begin{cases} x = 3, y = 4 \\ x = 4, y = 3 \end{cases}$

g) $\begin{cases} x = 2, y = 8 \\ x = 8, y = 2 \end{cases}$ h) $\begin{cases} x = 2, y = 3 \\ x = -2, y = -3 \\ x = 3, y = 2 \\ x = -3, y = -2 \end{cases}$ i) $\begin{cases} x = 2, y = 4 \\ x = 4, y = 2 \end{cases}$ j) $\begin{cases} x = 28, y = 12 \\ x = -28, y = -12 \end{cases}$

6. 1. $\begin{cases} x = 4, y = 2 \\ x = \dfrac{28}{3}, y = -\dfrac{26}{3} \end{cases}$ 2. *No té solució* 3. $\begin{cases} x = -2, y = -4 \\ x = 4, y = 2 \end{cases}$ 4. $\begin{cases} x = 4, y = 3 \\ x = 32, y = 45 \end{cases}$

5. $\begin{cases} x = 2, y = -10 \\ x = -5, y = 4 \end{cases}$ 6. $\begin{cases} x = 5y = -1 \\ x = -\dfrac{9}{2}, y = -\dfrac{23}{4} \end{cases}$ 7. $\begin{cases} x = 1, y = 2 \\ x = \dfrac{22}{13}, y = -\dfrac{1}{13} \end{cases}$ 8. $\begin{cases} x = 2, y = 10 \\ x = 10, y = 2 \end{cases}$

9. $\begin{cases} x = 5, y = 4 \\ x = 5, y = -4 \\ x = -5, y = 4 \\ x = -5, y = -4 \end{cases}$ 10. $\begin{cases} x = 2, y = 1 \\ x = 2, y = -1 \\ x = -2, y = 1 \\ x = -2, y = -1 \end{cases}$ 11. $\begin{cases} x = 6, y = 4 \\ x = 6, y = -4 \\ x = -6, y = 4 \\ x = -6, y = -4 \end{cases}$ 12. $\begin{cases} x = 1, y = \sqrt{2} \\ x = 1, y = -\sqrt{2} \\ x = -1, y = \sqrt{2} \\ x = -1, y = -\sqrt{2} \end{cases}$

13. $\begin{cases} x = 3, y = 5 \\ x = -3, y = -5 \\ x = 5, y = 3 \\ x = -5, y = -3 \end{cases}$

14. $\begin{cases} x = \sqrt{3}, y = 2\sqrt{3} \\ x = -\sqrt{3}, y = -2\sqrt{3} \\ x = 2\sqrt{3}, y = \sqrt{3} \\ x = -2\sqrt{3}, y = -\sqrt{3} \end{cases}$

15. $\begin{cases} x = 1, y = 5 \\ x = -1, y = -5 \\ x = 5, y = 1 \\ x = -5, y = -1 \end{cases}$

16. $\begin{cases} x = 2, y = 6 \\ x = -2, y = -6 \\ x = 6, y = 2 \\ x = -6, y = -2 \end{cases}$

17. $\begin{cases} x = 7, y = 1 \\ x = -7, y = -1 \\ x = 4\sqrt{2}, y = 3\sqrt{2} \\ x = -4\sqrt{2}, y = -3\sqrt{2} \end{cases}$

18. $\begin{cases} x = 2, y = 5 \\ x = -2, y = -5 \\ x = \dfrac{3\sqrt{6}}{2}, y = -\sqrt{6} \\ x = -\dfrac{3\sqrt{6}}{2}, y = \sqrt{6} \end{cases}$

19. $\begin{cases} x = 4, y = 5 \\ x = -4, y = -5 \\ x = \dfrac{\sqrt{2}}{2}, y = \dfrac{9\sqrt{2}}{2} \\ x = -\dfrac{\sqrt{2}}{2}, y = -\dfrac{9\sqrt{2}}{2} \end{cases}$

20. $\begin{cases} x = 9, y = 2 \\ x = -9, y = -2 \end{cases}$

21. $\begin{cases} x = 7, y = 1 \\ x = -7, y = -1 \\ x = 4\sqrt{2}, y = 3\sqrt{2} \\ x = -4\sqrt{2}, y = -3\sqrt{2} \end{cases}$