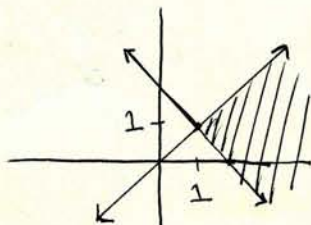
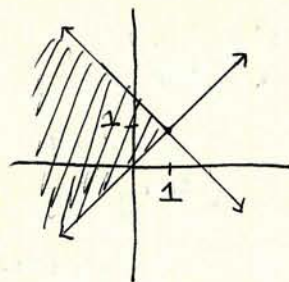


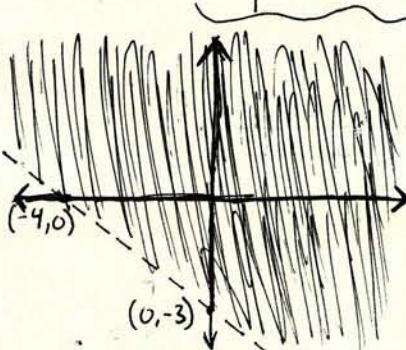
$$2) \begin{cases} x - y \geq 0 \\ x + y \geq 2 \end{cases}$$



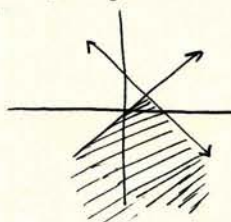
$$b) \begin{cases} x - y \leq 0 \\ x + y \leq 2 \end{cases}$$



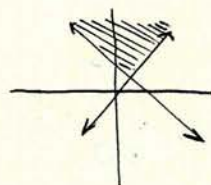
$$10) 3x + 4y + 12 > 0$$



$$c) \begin{cases} x - y \geq 0 \\ x + y \leq 2 \end{cases}$$



$$d) \begin{cases} x - y \leq 0 \\ x + y \geq 2 \end{cases}$$

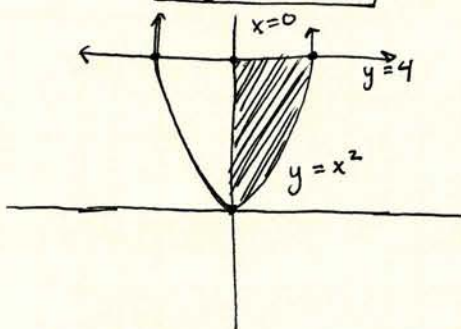


$$20) y = x^3 - 4x$$

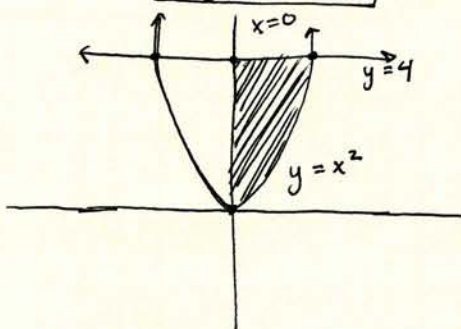
since the boundary is a solid curve

$$y \geq x^3 - 4x$$

$$\text{Test } (1, 1) \Rightarrow (1) \geq (1)^3 - 4(1) \checkmark \text{ TRUE!}$$



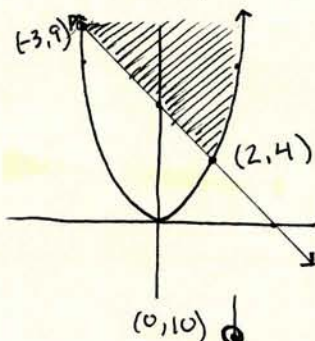
$$30) \begin{cases} y \geq x^2 \\ y \leq 4 \\ x \geq 0 \end{cases}$$



$$\text{vertices are } \begin{matrix} (0, 0) \\ (0, 2) \\ (2, 4) \end{matrix}$$

Bounded

$$32) \begin{cases} y \geq x^2 \\ x + y \geq 6 \end{cases}$$



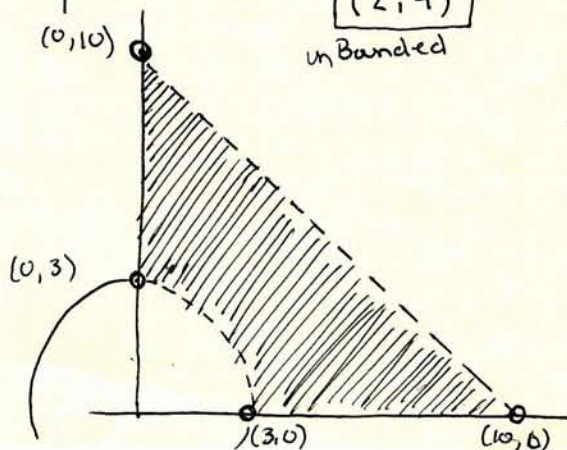
$$\begin{cases} y = x^2 \\ x + y = 6 \end{cases}$$

$$\text{vertices } \begin{matrix} (-3, 9) \\ (2, 4) \end{matrix}$$

unBounded

$$\begin{aligned} x + (x^2) &= 6 \\ x^2 + x - 6 &= 0 \\ (x - 2)(x + 3) &= 0 \\ x &= 2, -3 \end{aligned}$$

$$34) \begin{cases} x > 0 \\ y > 0 \\ x + y < 10 \\ x^2 + y^2 > 9 \end{cases}$$



$$\text{vertices } \begin{matrix} (0, 3) \\ (0, 10) \\ (3, 0) \\ (10, 3) \end{matrix}$$

Bounded



36, 46

$$36) \begin{cases} x^2 + y^2 < 9 \\ 2x + y^2 \geq 1 \end{cases}$$

$$\begin{cases} x^2 + y^2 = 9 \\ 2x + y^2 = 1 \end{cases}$$

$$y^2 = 1 - 2x \Rightarrow x^2 + 1 - 2x = 9$$

$$x^2 - 2x - 8 = 0$$

$$(x-4)(x+2) = 0$$

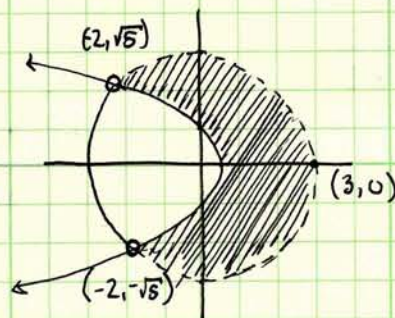
$$x = 4, -2$$

$$x = 4 \text{ gives unreal answer}$$

vertices

$$\begin{pmatrix} -2, -\sqrt{5} \\ -2, \sqrt{5} \end{pmatrix}$$

Bounded



$$46) \begin{cases} y \geq x^3 \\ y \leq 2x + 4 \\ x + y \geq 0 \end{cases}$$

$$\begin{cases} y = x^3 \\ y = 2x + 4 \\ x + y = 0 \end{cases}$$

$$x + 2x + 4 = 0$$

$$3x = -4$$

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

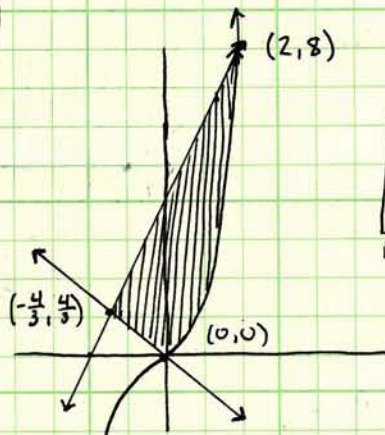
$$\left(-\frac{4}{3}, \frac{4}{3}\right)$$

$$x^3 = 2x + 4$$

$$x^3 - 2x - 4 = 0$$

$$(x-2)(x^2 + 2x + 2) = 0$$

$$x = 2 \Rightarrow (2, 8)$$



$$\begin{pmatrix} 2, 8 \\ 0, 0 \\ -\frac{4}{3}, \frac{4}{3} \end{pmatrix}$$

Bounded