

a) $\frac{x^2}{16} - \frac{(y+1)^2}{4} = 1$ $\sigma_1 \parallel x$ ~~⊥~~

$a=4$ $b=2$ $S=[0, -1]$

$h, h': y = \pm \frac{b}{a}x + q$
 $y = \pm \frac{2}{4}x + q$

$h: y = \frac{1}{2}x + q$
 $S \Rightarrow -1 = q$
 $y = \frac{1}{2}x - 1$
 $h: x - 2y - 2 = 0$

$h': y = -\frac{1}{2}x + q$
 $-1 = q$
 $y = -\frac{1}{2} - 1$
 $h': x + 2y + 2 = 0$

b) $-\frac{(x+2)^2}{25} + \frac{(y-3)^2}{4} = 1$ $\sigma_1 \parallel y$ ~~⊥~~

$a=2$ $b=5$ $S=[-2, 3]$

$h, h': y = \pm \frac{a}{b}x + q$
 $y = \pm \frac{2}{5}x + q$

$h: y = \frac{2}{5}x + q$
 $S \Rightarrow 3 = -\frac{4}{5} + q$
 $15 + 4 = 5q$
 $q = \frac{19}{5}$
 $y = \frac{2}{5}x + \frac{19}{5}$
 $h: 2x - 5y + 19 = 0$

$h': y = -\frac{2}{5}x + q$
 $3 = \frac{4}{5} + q$
 $15 - 4 = 5q$
 $q = \frac{11}{5}$
 $h': y = -\frac{2}{5}x + \frac{11}{5}$
 $2x + 5y - 11 = 0$

c) $\frac{(x+1)^2}{9} - \frac{(y-2)^2}{36} = 1$ $\sigma_1 \parallel x$ ~~⊥~~

$a=3$ $b=6$ $S=[-1, 2]$

$y = \pm \frac{b}{a}x + q$
 $h: y = 2x + q$
 $S \Rightarrow 2 = -2 + q$
 $q = 4$

$y = 2x + 4$
 $h: 2x - y + 4 = 0$

$h': y = -2x + q$
 $2 = 2 + q$
 $q = 0$

$h': y = -2x$
 $h': 2x + y = 0$

d) $-\frac{(x-3)^2}{1} + \frac{(y+1)^2}{9} = 1$ $\sigma_1 \parallel y$ ~~⊥~~

$a=3$ $b=1$ $S=[3, -1]$

$h, h': y = \frac{3}{1}x + q$

$h: y = 3x + q$
 $S \Rightarrow -1 = 9 + q$
 $q = -10$
 $y = 3x - 10$

$h: 3x - y - 10 = 0$

$h': y = -3x + q$
 $h': -1 = -9 + q$
 $q = +8$
 $y = -3x + 8$

$h': 3x + y - 8 = 0$

$$e) \frac{(x-5)^2}{7} - \frac{(y+2)^2}{7} = 1 \quad \sigma_1 \parallel x \rightarrow \text{!}$$

$$a = b = \sqrt{7}$$

$$S = [\sqrt{7}; -2]$$

$$h: y = x + q$$

$$S \Rightarrow -2 = 5 + q$$

$$q = -7$$

$$h: y = x - 7$$

$$\underline{h': x - y + 7 = 0}$$

$$h, h': y = \pm \frac{\sqrt{7}}{\sqrt{7}} x + q$$

$$h': y = -x - q$$

$$-2 = -5 + q$$

$$q = 3$$

$$h': y = -x + 3$$

$$\underline{h': x + y - 3 = 0}$$

$$f) -\frac{x^2}{12} + \frac{y^2}{48} = 1 \quad \sigma_1 \parallel y \quad \text{✖}$$

$$a = \sqrt{48} = 4\sqrt{3}$$

$$b = \sqrt{12} = 2\sqrt{3}$$

$$S = [0; 0]$$

$$\frac{a}{b} = \sqrt{\frac{48}{12}} = \sqrt{4} = 2$$

$$\text{melko } \frac{4\sqrt{3}}{2\sqrt{3}} = 2$$

$$h: y = 2x$$

$$\underline{h': 2x - y = 0}$$

$$h, h': y = \pm 2x + q$$

$$S \Rightarrow 0 = \pm 0 + q$$

$$q = 0$$

$$h': y = -2x$$

$$\underline{h': 2x + y = 0}$$