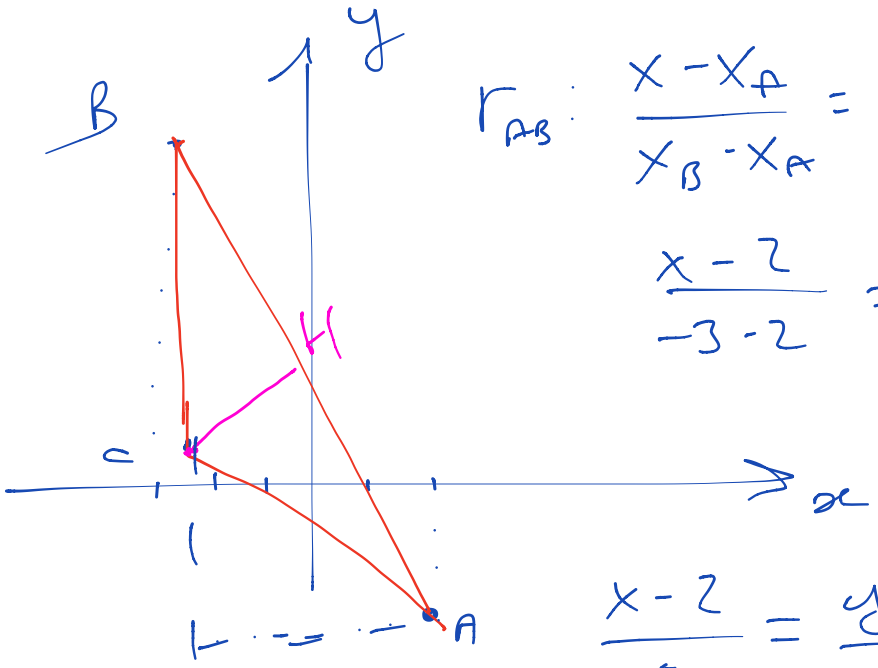
$A(2,-3)$ $B(-3,7)$ $C\left(-\frac{5}{2},1\right)$



$r_{AB}: \quad \frac{x-x_A}{x_B-x_A} = \frac{y-y_A}{y_B-y_A}$

$\frac{x-2}{-3-2} = \frac{y+3}{7+3}$

$\frac{x-2}{-5} = \frac{y+3}{10}$

$-2x+4 = y+3$

$2x+y-1=0$ $\qquad C\left(-\frac{5}{2};1\right)$

$d(C, r_{AB}) = \frac{\left|2\left(-\frac{5}{2}\right)+1\cdot 1-1\right|}{\sqrt{4+1}} =$

$= \frac{|-5|}{\sqrt{5}} = \frac{5}{\sqrt{5}} = \frac{5\sqrt{5}}{5} = \sqrt{5}$

$y-1 = m\left(x+\frac{5}{2}\right)$ $\qquad m = -\frac{1}{m_{AB}} = \frac{1}{2}$

$$y - 1 = \frac{1}{2}\left(x + \frac{5}{2}\right)$$

$$y - 1 = \frac{1}{2}x + \frac{5}{4}$$

$$y = \frac{1}{2}x + \frac{5}{4} + 1 \Rightarrow y = \frac{1}{2}x + \frac{9}{4}$$

$$H \begin{cases} y = \frac{1}{2}x + \frac{9}{4} \\ 2x + y - 1 = 0 \end{cases}$$

$$2x + \frac{1}{2}x + \frac{9}{4} - 1 = 0$$

$$8x + 2x + 9 - 4 = 0$$

$$10x = -5 \Rightarrow x = -1/2$$

$$y = \frac{1}{2}\left(-\frac{1}{2}\right) + \frac{9}{4} = -\frac{1}{4} + \frac{9}{4} = 2$$

$$H\left(-\frac{1}{2}, 2\right)$$

$$kx-(k-2)y+4k-6=0$$

a)

$k=0 \rightarrow \begin{cases} 2y-6=0 \\ 2x+2=0 \end{cases} \begin{cases} x=-1 \\ y=3 \end{cases}$

$k=2 \rightarrow$

$C(-1;3)$

$$kx-ky+2y+4k-6=0$$

$$2y-6+k(x-y+4)=0$$

$$\begin{cases} 2y-6=0 \\ x-y+4=0 \end{cases} \Rightarrow C(-1;3)$$

b) $k=0$

$2y-6=0 \Rightarrow y=3$

c) $k-2=0 \Rightarrow k=2$

$2x+2=0 \Rightarrow x=-1$

d) $4k-6=0$ $\quad O(0,0)$

$k=\frac{3}{2}$

$\frac{3}{2}x-\left(\frac{3}{2}-2\right)y+4\left(\frac{3}{2}\right)-6=0$

$\frac{3}{2}x+\frac{1}{2}y+6-6=0$

$3x+y=0 \Rightarrow y=-3x$

e) $A(-2;3)$

$-2k-(k-2)\cdot 3+4k-6=0$

$-2k-3k+6+4k-6=0$

$-k=0 \Rightarrow k=0$

$y=3$

f) $2x-y+3=0$

$m_k=\frac{k}{k-2}$ $\qquad m=\frac{-2}{-1}=2$

$\frac{k}{k-2}=2 \Rightarrow k=2k-4 \Rightarrow k=4$

$4x-2y+10=0$

$$2x - y + 5 = 0$$

g) $x - 3y + 1 = 0$

$m = \frac{1}{3}$ $\quad m_\perp = -3$

$m_k = \frac{k}{k-2}$

$m = -\frac{a}{b}$ $\quad m_\perp = \frac{b}{a}$

$$\frac{k}{k-2} = -3 \Rightarrow k = -3k + 6$$

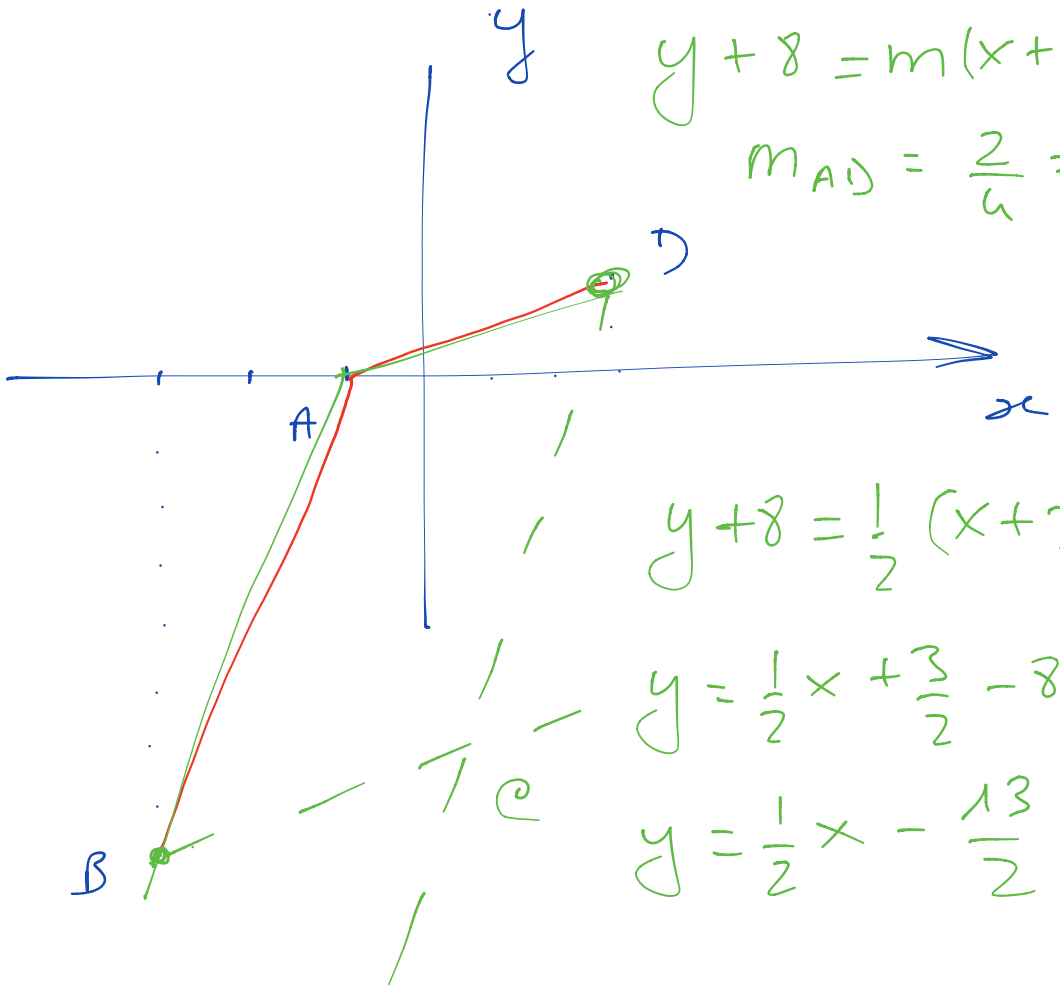
$$4k = 6 \; ; \; \underline{k = \frac{3}{2}}$$

$$y = -3x$$

n. 334 $4kx = y + 3$

$\nexists k \in \mathbb{R}$

n. 609 $A(-1;0)$ $B(-3,-8)$ $D(3,2)$



$y+8=m(x+3)$

$m_{AD}=\frac{2}{4}=\frac{1}{2}$

$y+8=\frac{1}{2}(x+3)$

$y=\frac{1}{2}x+\frac{3}{2}-8$

$y=\frac{1}{2}x-\frac{13}{2}$

$y-2=m(x-3)$ $\quad m_{AB}=4$

$y-2=4(x-3)$

$y-2=4x-12$

$y=4x-10$

$$\begin{cases} y = 4x - 10 \\ y = -\frac{1}{2}x - \frac{13}{2} \end{cases}$$

n.15 $A(1-a;\ 2a)$ $\quad B\left(x;\ \frac{x}{2}\right)$

$$M_{AB}\left(a+1;\ \frac{1}{2}a\right)$$

$$x_M = \frac{x_A + x_B}{2} \Rightarrow x_B = 2x_M - x_A$$

$$y_M = \frac{y_A + y_B}{2} \Rightarrow y_B = 2y_M - y_A$$

$$x_B = 2(a+1) - (1-a) =$$

$$= 2a + 2 - 1 + a = 3a + 1$$

$$y_B = 2\left(\frac{1}{2}a\right) - 2a = a - 2a = -a$$

$$-a = \frac{3a+1}{2} \Rightarrow -2a = 3a + 1$$

$$5a = -1\ ;\quad a = -1/5$$

n.8 $m_1 = 2$ $m_2 = 3$

$y = mx$

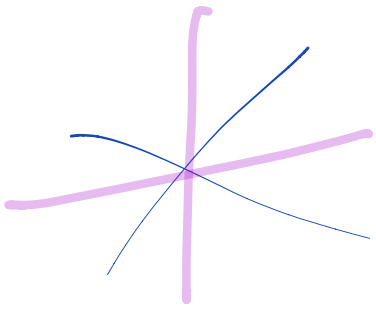
$y = 2x$ $y = 3x$

$2x - y = 0$ $3x - y = 0$

$P(x, y)$

$$\frac{|2x - y|}{\sqrt{4+1}} = \frac{|3x - y|}{\sqrt{9+1}}$$

$$\frac{|2x - y|}{\sqrt{5}} = \frac{|3x - y|}{\sqrt{10}\sqrt{2}}$$



$\sqrt{2}\,|2x - y| = |3x - y|$

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

$2\sqrt{2}x - \sqrt{2}y - 3x + y = 0$

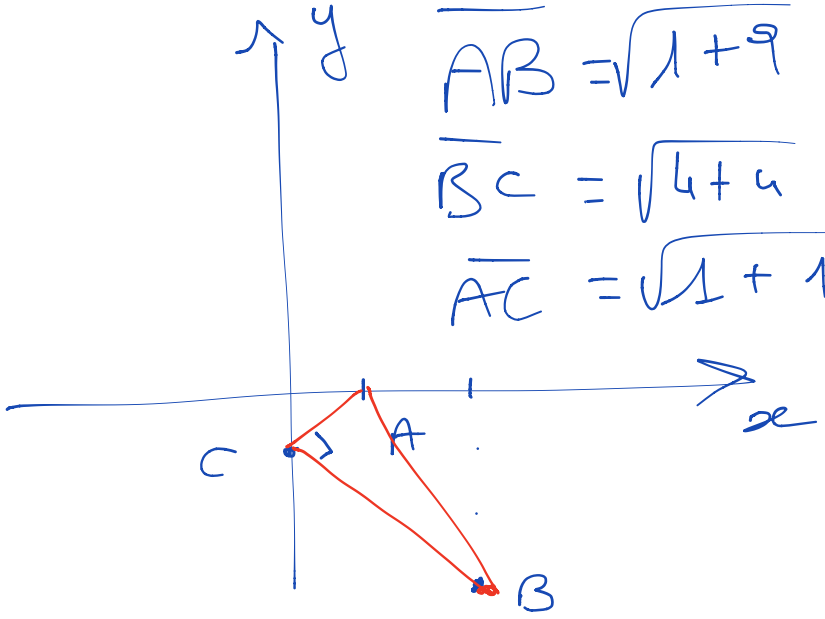
$$(2\sqrt{2}-3)x-(\sqrt{2}-1)y=0$$

2) $\sqrt{2}(2x-y)=-3x+y$

$$2\sqrt{2}x-\sqrt{2}y+3x-y=0$$

$$(2\sqrt{2}+3)x-(\sqrt{2}+1)y=0$$

n.4 $A(1,0)$ $B(2,-3)$ $C(0,-1)$



$\overline{AB}=\sqrt{1+9}=\sqrt{10}$

$\overline{BC}=\sqrt{4+4}=\sqrt{8}$

$\overline{AC}=\sqrt{1+1}=\sqrt{2}$

Poiché $\overline{AB}^2=\overline{BC}^2+\overline{AC}^2$

il triangolo è rettangolo

$$a = \frac{1}{2}\sqrt{8}\cdot\sqrt{2} = \frac{1}{2}\cdot\sqrt{16} = \frac{1}{2}\cdot 4 = 2$$

$$S = \frac{1}{2}\begin{vmatrix} 1 & 0 & 1 & 1 & 0 \\ 2 & -3 & 1 & 2 & -3 \\ 0 & -1 & 1 & 0 & -1 \end{vmatrix} =$$

$$= \frac{1}{2}\left| -3 - 2 + 1 \right| = \frac{1}{2}\left|-4\right| = \frac{1}{2}\cdot 4 = 2$$

п.11 $x_A = \frac{1}{2}$ $y_B = 6$

$$y = 5x - 4$$

$$y_A = 5\cdot\frac{1}{2} - 4 = \frac{5}{2} - 4 = -\frac{3}{2}$$

$$x_B = \frac{y_B + 4}{5} = \frac{6+4}{5} = 2$$

$A\left(\frac{1}{2}; -\frac{3}{2}\right)$ $B(2; 6)$

$$\overline{AB} = \sqrt{\left(2 - \frac{1}{2}\right)^2 + \left(6 + \frac{3}{2}\right)^2} =$$

$$= \sqrt{\left(\frac{3}{2}\right)^2 + \left(\frac{15}{2}\right)^2} = \sqrt{\frac{9}{4} + \frac{225}{4}} = \sqrt{\frac{234}{4}}$$