Settimana: 19

Materia: Matematica
Classe: 3D
Data: 24/02/2026

Argomenti:

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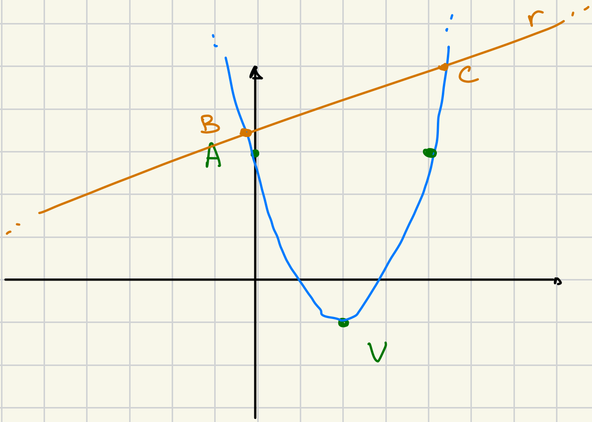
$V=(2;-1)$
$A=(0;3)$ $\qquad y=ax^2+bx+c$
$r:\ y=x+9$

1) Parabola di vertice V che passa per A.



$$V=\left(-\frac{b}{2a};-\frac{\Delta}{4a}\right)=(2;-1)$$

$$\begin{cases}-\dfrac{b}{2a}=2\\ -\dfrac{\Delta}{4a}=-1\\ 3=0+0+c\end{cases} \rightsquigarrow \begin{cases}c=3\\ b=-4a\\ b^2-4ac=4a\end{cases} \quad \begin{cases}c=3\\ b=-4a\\ 16a^2-12a-4a=0\end{cases}$$

$$16a(a-1)=0 \quad \begin{cases} a=0 \ \text{N.A.}\\ \boxed{a=1}\end{cases}$$

$a=1$, $b=-4$, $c=3$ $\qquad \boxed{y=x^2-4x+3}$

Pti intersezione: r e Parabola

$$\begin{cases}y=x+9\\ x+9=x^2-4x+3\end{cases} \rightarrow x^2-5x-6=0 \rightsquigarrow (x-6)(x+1)=0 \quad \begin{cases}x=6\\ x=-1\end{cases}$$

$\rightsquigarrow$ $B=(6;15)$, $C=(-1;8)$

518 $\quad y = 2x^2 - (4k-8)x + 1$. Trova k in modo che

(a) l'ordinata di V sia minore di -1

$$-\frac{\Delta}{4a} < 1 \quad \rightsquigarrow \quad -\frac{b^2-4ac}{4a} < -1 \qquad -\frac{(4k-8)^2 - 4\cdot 2\cdot 1}{4\cdot 2} < -1$$

$$16k^2 + 64 - 64k - 8 > 8$$

$$16k^2 - 64k + 48 > 0 \quad \rightsquigarrow \quad k^2 - 4k + 3 > 0$$

$$(k-3)(k-1) > 0 \qquad \begin{cases} k=1 \\ k=3 \end{cases}$$

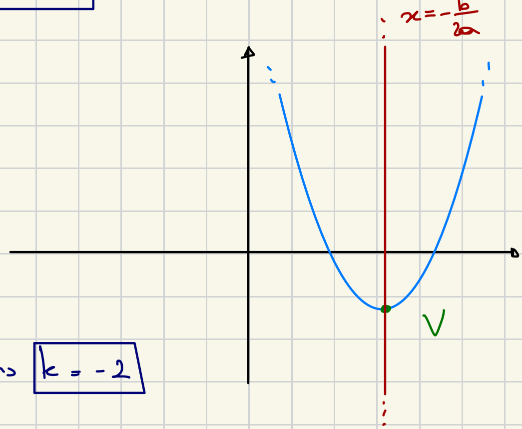
$$\boxed{k < 1 \quad \vee \quad k > 3}$$

(b) Asse di simmetria $x = -4$

$$-\frac{b}{2a} = -4 \quad \rightsquigarrow \quad b = 8a$$

$$-(4k-8) = 16$$

$$-4k + 8 = 16 \quad \rightsquigarrow \quad -4k = 8 \quad \rightsquigarrow \quad \boxed{k = -2}$$

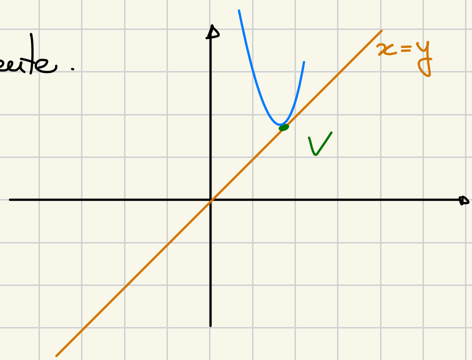


(c) Vertice su bisettrice I–III quadrante.

$$V = \left(-\frac{b}{2a} \,;\, -\frac{\Delta}{4a}\right)$$

$$-\frac{-(4k-8)}{2\cdot 2} = -\frac{[-(4k-8)]^2 - 4\cdot 2\cdot 1}{4\cdot 2}$$

$$\frac{\overset{k-2}{\cancel{4}k - \cancel{8}}}{\cancel{4}} = -\frac{\overset{2k^2+8-8k-1}{\cancel{16}k^2 + \cancel{64} - \cancel{64}k - \cancel{8}}}{\cancel{8}}$$



$$k-2=-2k^2-8+8k+1$$

$$2k^2-7k+5=0 \rightsquigarrow 2k^2-2k-5k+5=0$$
$$2k(k-1)-5(k-1)=0$$
$$(2k-5)(k-1)=0 \quad \begin{cases} \boxed{k=\frac{5}{2}} \\ \boxed{k=1} \end{cases}$$

(d) Fuoco con ordinata nulla $\quad F=\left(-\frac{b}{2a};\ \frac{1-\Delta}{4a}\right)$

$$\frac{1-\Delta}{\cancel{4a}}=0 \qquad 1-\{[-(4k-8)]^2-4\cdot 2\cdot 1\}=0$$
$$1-\{16k^2+64-64k-8\}=0$$
$$1-(16k^2-64k+56)=0$$
$$16k^2-64k+55=0$$

$$\frac{\Delta}{4}=(32)^2-55\cdot 16=16(32\cdot 2-55)=16(64-55)=16\cdot 9$$

$$\sqrt{\frac{\Delta}{4}}=12 \rightsquigarrow \frac{32\pm 12}{16} \quad \begin{cases} 48/16=3 \\ \frac{20}{16}=\frac{5}{4} \end{cases}$$