

1.4.28

$$A(1; 5)$$

$$B(7; 3)$$

$$C(2; 1)$$

$$D(-3; 1)$$

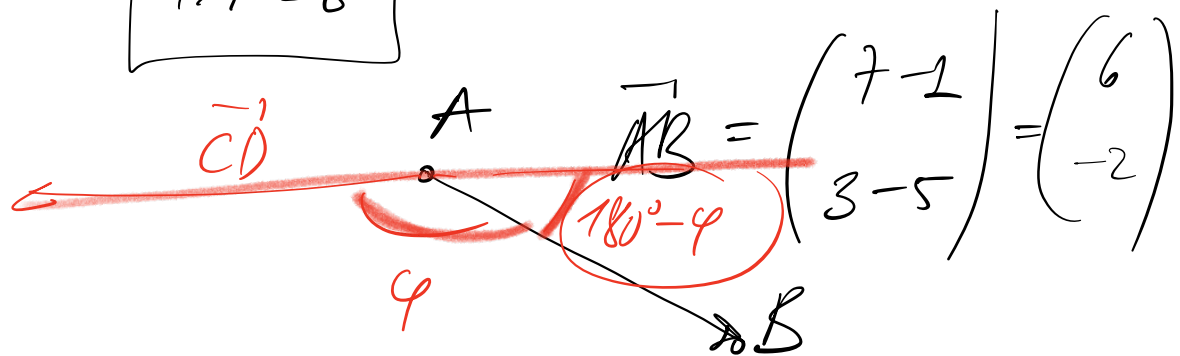


Diagram illustrating the angle φ between vectors $\vec{AB}$ and $\vec{CD}$. Vector $\vec{CD}$ is calculated as $\begin{pmatrix} -3-2 \\ 1-1 \end{pmatrix} = \begin{pmatrix} -5 \\ 0 \end{pmatrix}$.

$$\cos \varphi = \frac{\vec{AB} \cdot \vec{CD}}{|\vec{AB}| \cdot |\vec{CD}|}$$

$$= \frac{-30}{5\sqrt{40}} \approx -0,948683$$

$$\varphi \approx \cos^{-1}(-0,948683) \approx 161,56 \approx 162$$

$$\Rightarrow \angle \text{angle sign laut } \approx 180^\circ - 162^\circ = \underline{\underline{18^\circ}}$$

1.4.5

$$\vec{AP} = \begin{pmatrix} -3 \\ -4 \end{pmatrix}$$

$$\vec{BP} = \begin{pmatrix} 4 \\ -1-k \end{pmatrix}$$

$$\|\vec{AP}\| = \|\vec{BP}\| \Leftrightarrow \|\vec{AP}\|^2 = \|\vec{BP}\|^2$$

$$A = -1 \quad B = k$$

$$\Leftrightarrow (-3)^2 + (-4)^2 = 4^2 + (-1-k)^2 \quad (A-B)^2$$

$$\Leftrightarrow 9 + 16 = 16 + (-1)^2 - 2 \cdot (-1) \cdot k + k^2 \quad A^2 - 2AB + B^2$$

$$\Leftrightarrow 9 = 1 + 2k + k^2$$

$$\Leftrightarrow k^2 + 2k - 8 = 0$$

$$k = \frac{-2 \pm \sqrt{4 - 4 \cdot 1 \cdot (-8)}}{2}$$

$$k = \frac{-2 \pm \sqrt{36}}{2} \begin{cases} 2 \\ -4 \end{cases}$$