12, 1, 3, 5, 7.

1, Finn skalarproduktet

$(-2, 3) \quad (4, 1)$

$= -2 \cdot 4 + 3 \cdot 1$

$= -8 + 3 = -5$

$A \cdot B = |A||B| \cos v$

$-5 = \sqrt{2^2 + 3^2} \cdot \sqrt{4^2 + 1^2} \cos v$

$-5 = \sqrt{4 + 9} \cdot \sqrt{16 + 1} \cos v$

$-5 = \sqrt{13} \cdot \sqrt{17} \cos v$

$-5 = \sqrt{221} \cos v$

$\frac{-5}{\sqrt{221}} = \cos v$

$\arccos \frac{-5}{\sqrt{221}} = v$

$v = 19{,}65^0$

3) $(1, 2, 3)$ og $(-1, 0, 1)$

$$1 \cdot -1 + 2 \cdot 0 + 3 \cdot 1$$

$$= -1 + 0 + 3 = 2$$

$$2 = \sqrt{1^2 + 2^2 + 3^2} \cdot \sqrt{(-1)^2 + 0^2 + 1^2} \cos v$$

$$= \sqrt{1 + 4 + 9} \cdot \sqrt{1 + 1} \cos v$$

$$= \sqrt{14} \cdot \sqrt{2} \cos v$$

$$2 = 2 \cdot \sqrt{7} \cos v$$

$$1 = \sqrt{7} \cos v$$

$$\frac{1}{\sqrt{7}} = \cos v \Rightarrow \arccos \frac{1}{\sqrt{7}} = v$$

$$v = 67{,}79^\circ$$

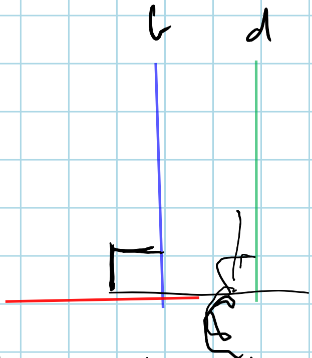
7) $a = (4,3)$, "a" $=$ sum$[\vec{b}, \vec{c}]$

der "b" er parallel med "d" $= (1,2)$

og "c" står normalt på "d"

$$\frac{A \cdot B}{|A|\,|B|} = \cos V$$

$$a = (\underbrace{b_1 + c_1}_{4}, \overbrace{b_2 + c_2}^{3})$$



a og b er normale når

b: $\quad \bar{b} = s(\bar{d}) = (s, 2s)$, $s \neq 0$

c: c er normalt med d når $\bar{c} \cdot \bar{d} = 0$

$$(\overset{c_1}{x} \cdot \overset{d_1}{1}) + (\overset{c_2}{y} \cdot \overset{d_2}{2}) = x + 2y = 0$$

$$\underset{a}{\begin{bmatrix} 4 \\ 3 \end{bmatrix}} = \begin{bmatrix} 2 \\ 4 \end{bmatrix} \begin{bmatrix} 2 \\ -1 \end{bmatrix}$$

$$(c_1 \cdot d_1) + (c_2 \cdot d_2) = 0$$

$$(c_1 \cdot 1) + (c_2 \cdot 2) = 0$$

$$(\pm 2 \cdot 1) + (\mp 1 \cdot 2) = 0$$

$$\boxed{\begin{aligned} \bar{b} &= s\bar{d} = (s, 2s), \ s \neq 0 \\ &= (2, 1)s \\ &\text{s skaleres til det passer ??} \end{aligned}}$$

$$c_1 = \pm 2 \ , \ c_2 = \mp 1$$

$$\begin{bmatrix} 4 \\ 1 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \end{bmatrix} + \begin{bmatrix} -2 \\ 1 \end{bmatrix} \quad \vee \quad \begin{bmatrix} 4 \\ 3 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \end{bmatrix} + \begin{bmatrix} 2 \\ -1 \end{bmatrix}$$

$$\begin{bmatrix} 4 \\ 3 \end{bmatrix} = \begin{bmatrix} 6 \\ 2 \end{bmatrix} + \begin{bmatrix} -2 \\ 1 \end{bmatrix} \quad \vee \quad \begin{bmatrix} 4 \\ 3 \end{bmatrix} = \begin{bmatrix} 2 \\ 4 \end{bmatrix} + \begin{bmatrix} 2 \\ -1 \end{bmatrix}$$

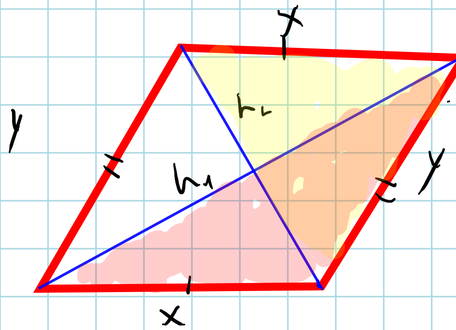
13. $\bar{a}, \bar{b}$ $\quad |a| = 3$, $\quad b = 2$

$|a+b| = 7$

dette er feil pga $|a+b| \le |a| + |b|$

$3 + 2 < 7$

15. II



$2 \cdot h_1^2 = 2(x^2 + y^2)$

$2 \cdot h_2^2 =$ " "

$\cancel{2}(h_2^2 + h_1^2) = \cancel{2}(x^2 + y^2) + \cancel{2}(x^2 + y^2)$

$2x^2 + 2y^2 = h_1^2 + h_2^2$

$h_1^2 = y^2 + x^2$

$h_2^2 = y^2 + x^2$