② $\sum_{k=3}^{15}(2k+1)$ $k=1$

$k=3$

$h=k-2$

$k=3 \quad h=1$

$k=15 \quad h=13$

$$\sum_{h=1}^{13}(2\cdot(h+2)+1)=\sum_{h=1}^{13}(2h+4+1)=$$

$$=\sum_{h=1}^{13}(2h+5)$$

Home work (week 3) 04/20/25

logarithmics.

① $\boxed{\log_a a^b = 10g_a^{a^b} = b}$

$\boxed{\sqrt[m]{a^k} = a^{\frac{k}{m}}}$

$$\log_2 \frac{\sqrt[1]{8\sqrt{2}}}{16_2} = \log_2 \frac{\sqrt{2}}{2} = \log_2 \frac{2^{\frac{1}{2}}}{2} =$$

$\boxed{\frac{a^k}{a^m} = a^{k-m}}$ $= \log_2 2^{\frac{1}{2}} = \log_2 2^{\frac{1}{2}-1} =$

$= \log_2 2^{-\frac{1}{2}} = \boxed{-\frac{1}{2}}$

$\log_2 32 = \log_2 2^5 = 5$

$2\log_2 4 = 2\log_2 2^2 = 2\cdot 2 = 4$

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

(2) $\log_a b + \log_a c = \log_a b \cdot c$

$\log_3 (x-1)\cdot(x+1) = 2$ $\quad (a-b)\cdot(a+b)=a^2-b$

$\log_3 (x^2-1) = 2$ $\quad \log_a b = c \to b = a^c$

$x^2-1 = 3^2$

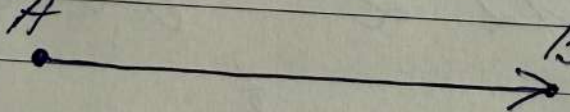
$x^2 = 9+1$

$x^2 = 10$

$x = \pm\sqrt{10}$

$x = \sqrt{10}$

(12)



$\vec{AB} = (4-1;\ 6-2;\ 9-3) = (3;\ 4;\ 6)$

$\vec{AB} = \sqrt{3^2+4^2+6^2} = \sqrt{9+16+36} = \sqrt{61}$

$\vec{a} = \left(\frac{3}{\sqrt{61}};\ \frac{4}{\sqrt{61}};\ \frac{6}{\sqrt{61}}\right)$ ж

(13) $\vec{v} = \begin{bmatrix} 7 \\ -2 \\ 4 \end{bmatrix}$ $|\vec{v}| = \sqrt{7^2 + (-2)^2 + 4^2} =$

$= \sqrt{49 + 4 + 16} = \sqrt{69}$

(16) $\cos\varphi = \dfrac{\vec{p} \cdot \vec{q}}{|\vec{p}| \cdot |\vec{q}|}$

$\vec{p} \cdot \vec{q} = 1 \cdot 4 + 2 \cdot (-5) + 3 \cdot 6 =$

$= 4 - 10 + 18 = 12$

$|\vec{p}| = \sqrt{1^2 + 2^2 + 3^2} = \sqrt{14}$

$|\vec{q}| = \sqrt{4^2 + (-5)^2 + 6^2} = \sqrt{16 + 25 + 36} =$

$= \sqrt{77}$

$\cos\varphi = \dfrac{12}{\sqrt{14} \cdot \sqrt{77}} = 0{,}3647$

$\varphi = 68{,}58°$

(17) $\vec{u} \cdot \vec{v} = 2 \cdot (-8) + (-1) \cdot 4 + 4(-16) =$

$= -16 - 4 - 64 = -84 \neq 0$ (not orthogonal)

(14) $3\vec{a} - 2\vec{b} = 3 \cdot (2; -1; 3) - 2 \cdot (-1; 4; 2) =$

$= (6; -3; 9) - (-2; 8; 4) = (8; -11; 5).$