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1. Find the integral functions

a) $\int \sqrt{1-2x} dx$

a) $\int x\sqrt{1+3x^2} dx$

c) $\int \ln x dx$

2. A fly is walking on the wall along a straight line. As it moves a distance of 50cm, it has moved vertically 25cm upwards. Find the vector corresponding to the movement of the fly.

3. Consider vectors $\mathbf{a} = \mathbf{i} + \mathbf{j} - \mathbf{k}$ ja $\mathbf{b} = 3\mathbf{i} - 2\mathbf{j}$. Calculate

a) $\mathbf{a} + \mathbf{b}$, $\mathbf{a} - \mathbf{b}$, $2\mathbf{a} - 3\mathbf{b}$,

b) lengths $|\mathbf{a}|$ ja $|\mathbf{b}|$,

c) unit vectors $\hat{\mathbf{a}}$ ja $\hat{\mathbf{b}}$,

d) scalar product $\mathbf{a} \cdot \mathbf{b}$ and

e) the angle between vectors \mathbf{a} and \mathbf{b} .

4. Consider vectors $\mathbf{A} = 2\mathbf{i} - 5\mathbf{j}$, $\mathbf{B} = 4\mathbf{j}$ and $\mathbf{C} = 3\mathbf{i}$. Calculate

a) $\mathbf{C}(\mathbf{A} \times \mathbf{B})$, b) $\mathbf{C} \cdot (\mathbf{A} \times \mathbf{B})$, c) $\mathbf{C} \times (\mathbf{A} \times \mathbf{B})$ ja d) $\mathbf{C} + \mathbf{A} \times \mathbf{B}$.

5. Find a unit vector, which is perpendicular against the vectors $4\mathbf{i} - \mathbf{j} + 3\mathbf{k}$ and $-2\mathbf{i} + \mathbf{j} - 2\mathbf{k}$.