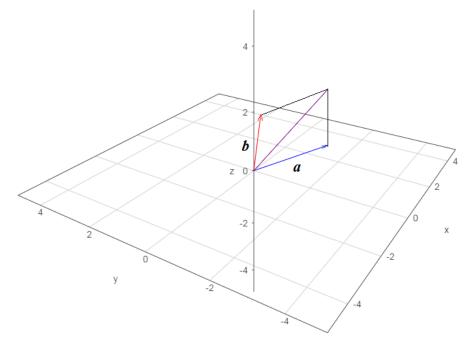
Answer on Question #68582, Math / Differential Equations Find the area of the parallelogram with sides a = i - 2j + k and b = 2i + j + kSolution



The area of the parallelogram will be the length of the cross product of adjacent sides. We have

$$a \times b = \begin{vmatrix} i & j & k \\ 1 & -2 & 1 \\ 2 & 1 & 1 \end{vmatrix} = = (-1)^{1+1}i \begin{vmatrix} -2 & 1 \\ 1 & 1 \end{vmatrix} + (-1)^{1+2}j \begin{vmatrix} 1 & 1 \\ 2 & 1 \end{vmatrix} + (-1)^{1+3}k \begin{vmatrix} 1 & -2 \\ 2 & 1 \end{vmatrix} = = i(-2-1) - j(1-2) + k(1-(-4)) = -3i + j + 5k$$

Thus, the area of the parallelogram is

$$|-3i + j + 5k| = \sqrt{(-3)^2 + (1)^2 + (5)^2} = \sqrt{35} \ (units^2)$$

Answer:  $\sqrt{35}$  units<sup>2</sup>.

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