

MATH-253: HW2

Due on 1/31/2024

Prof. Oleksandr Bobrovnikov (Sasha), Spring 2024, 1/31/2024

Kaleb Burris

2.4**184**

$$\text{a) } \langle 3, 2, -1 \rangle \times \langle 1, 1, 0 \rangle = i(0 + 1) - j(0 + 1) + k(3 - 2) = \underline{i + j + k}$$

b) Image

188

$$\begin{aligned} j \times (k \times j + 2j \times i - 3j \times j + 5i \times k) \\ = j \times (-i - 2k - 5j) = \underline{k - 2i} \end{aligned}$$

190

$$w = \frac{u \times v}{\|u \times v\|}$$

$$u \times v = \begin{vmatrix} i & j & k \\ 2 & 6 & 1 \\ 3 & 0 & 1 \end{vmatrix} = i(6 - 0) - j(2 - 3) + k(0 - 18) = 6i + j - 18k$$

$$\|u \times v\| = \sqrt{6^2 + 1^2 + 18^2} = \sqrt{361} = 19$$

$$w = \frac{u \times v}{\|u \times v\|} = \frac{6i}{19} + \frac{j}{19} - \frac{18k}{19}$$