▶▶解析：
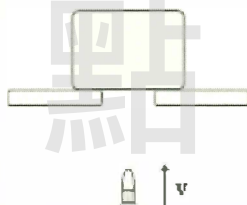
由力矩定義 $\vec{\tau} = \vec{r} \times \vec{F}$

$$\vec{\tau} = \vec{r} \times \vec{F} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 3 & 2 \\ 4 & 2 & 3 \end{vmatrix} = 5\hat{i} + 5\hat{j} - 10\hat{k}$$

33. A 10 g bullet moving 1000 m/s strikes and passes through a 2.0 kg block initially at rest, as shown. The bullet emerges from the block with a speed of 400 m/s. What is the **maximum** height at which the block will rise above its initial position?

(A) 78 cm   (B) 66 cm   (C) 56 cm   (D) 46 cm   (E) 37 cm

Ans：(D)

▶▶解析：

由動量守恆 $\sum_i m_i \vec{v}_i = M\vec{V}_{cm}$

$10 \times 10^{-3} \times 1000 + 0 = 10 \times 10^{-3} \times 400 + 2v$

$\Rightarrow v = 3[m/s]$

由機械能守恆 $E = K + U$

$\dfrac{1}{2} \times 2 \times 3^2 + 0 = 0 + 2 \times 9.8 \times h$

$\Rightarrow h = 0.459[m] \approx 46[cm]$