

Solutions

Accept equivalent correct methods and supported interpretations. The marks check reasoning; they are not an official grade.

2.1 D – Add matching components. A subtracts 1 from -3 ; B multiplies first components; C subtracts vectors. Addition requires $2+4$ and $-3+1$.

Correct response linked to the given case.

2.2 A – Inner dimensions match; outer dimensions give the result shape. B uses the inner size for the output; C copies the first factor's shape; D multiplies dimensions. Only outer dimensions survive.

Correct response linked to the given case.

2.3 $10 - \sqrt{(36+64)}=10$.

Correct response linked to the given case.

2.4 False – Order generally changes the result or whether the product is defined.

Correct response linked to the given case.

3.1 $\overrightarrow{AB} = B - A = (6, 8)$ m. Magnitude $|\overrightarrow{AB}| = \sqrt{6^2 + 8^2}$ m = 10 m. New endpoint $B + (-3, 2) = (4, 8)$ metres. Direction must not be reversed.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence
. Accurate conditions, checks or qualification.

3.2 $Q = \begin{pmatrix} 3 & 2 \\ 1 & 4 \end{pmatrix}$, $p = \begin{pmatrix} 2 \\ 7 \end{pmatrix}$ yuan per item. $Qp = \begin{pmatrix} 3(2) + 2(7) \\ 1(2) + 4(7) \end{pmatrix} = \begin{pmatrix} 20 \\ 30 \end{pmatrix}$ yuan. The item order must match the price order.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence.
Accurate conditions, checks or qualification.

3.3 AB has matching inner dimension 3 and outer dimensions 2 by 4. BA would require $4=2$, so it is undefined. Reversing a product is not harmless.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence.
Accurate conditions, checks or qualification.