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1.1    B    ✓✓

1.2    C    ✓✓

1.3    A    ✓✓

1.4    A    ✓✓


2.1    A vector is a (physical) quantity with magnitude and direction. ✓✓ (2 or 0)

2.2    Displacement. ✓

2.3    $R^2 = 12^2 + 5^2$ ✓

       $R = 13 \, km$ ✓


       $\tan\theta = \frac{5}{12}$ ✓

       $\theta = 22{,}62°$ ✓


       $\therefore R = 13 \, km$ bearing 67,38° (OR at 22,62° to the horizontal) ✓


3.1    A single vector having the same effect as two or more vectors together. ✓✓ (2 or 0)

3.2    ✓✓✓ One mark for each vector drawn with the correct magnitude, direction

       AND labelled. Subtract one mark if NOT drawn tail-to-head.

       ✓ Resultant correctly drawn with magnitude: 1660 N ± 40 N (8,3 cm ± 0,2 cm)

       ✓ Direction: bearing 315° OR 135° to the horizontal (± 2°) OR North West.

       Note:

       - If 1 vector is wrong: + mark (MAX: 4/5).

       - If 2 vectors are wrong: stop marking (MAX: 1/5).

       - If R is correctly drawn but no magnitude is written: give MAX 4/5.

3.3    YES. ✓+marking from 3.2

3.4    1660 N ✓+marking from 3.2

       bearing 135° OR 315° to the horizontal OR South East ✓+marking from 3.2

4.1    The rate of change of position. ✓✓ (2 or 0).

4.2    20 m ✓ right. ✓

4.3.1  $v = \dfrac{x}{\Delta t}$ ✓

$v = \dfrac{15 + 35}{25}$ ✓    $\left(\dfrac{50}{25}\right)$

$v = 2 \; m.s^{-1}$ ✓

4.3.2  $v = \dfrac{\Delta x}{\Delta t}$ ✓

$v = \dfrac{(-20) - (-40)}{25}$ ✓ +marking from 4.2    $\left(\dfrac{20}{25}\right)$    (taking to the left as positive)

$v = 0{,}8 \; m.s^{-1}$ to the left ✓

5.1    $a = \dfrac{\Delta v}{\Delta t}$ ✓

$a = \dfrac{(22) - (100)}{3}$ ✓    $\left(\dfrac{-78}{3}\right)$    (taking to the right as positive)

$a = (-) \, 26 \; m.s^{-2}$ ✓

<u>Note:</u>

$\Delta v = 100 - 22$ is WRONG even though it will give the correct magnitude of the acceleration. MAX: 1/3.

5.2    To the left. ✓