**Your Science Online**

## Cambridge IGCSE Physics 0625 style

# SPEED AND VELOCITY – MARK SCHEME

Maximum mark: 45 (Core: 26). ";" separates marking points. Accept correct alternative wording. Apply error carried forward (ecf) where shown. Do not award a final-answer mark if the unit is wrong or missing, unless the unit is printed on the answer line.

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| **1(a)** | average speed = (total) distance ÷ (total) time; | 1 | allow: v = s / t; allow symbols if defined |
| **1(b)** | 3.6 km = 3600 m **and** 12 min = 720 s;<br>3600 / 720;<br>5.0 (m/s); | 3 | correct answer with no working: 3 marks<br>0.3 km/min or 18 km/h scores 1 mark only |
| **1(c)** | 18 (km/h); | 1 | ecf: answer to (b) × 3.6 |
| **1(d)** | velocity has a direction / velocity is speed in a given direction / velocity is a vector and speed is a scalar; | 1 | |
| **1(e)** | reduces the effect of (random) errors / reaction time / anomalies, so the result is more reliable or accurate; | 1 | do not allow: "to make it a fair test" |
| **2(a)** | stationary / not moving / at rest; | 1 | do not allow: constant speed |
| **2(b)** | 40 / 20;<br>2.0 (m/s); | 2 | |
| **2(c)** | BC;<br>steepest gradient / slope; | 2 | reason can only score if BC chosen |
| **2(d)** | 100 / 60;<br>1.7 (m/s); | 2 | allow 1.67; do not allow 1.6 |
| **2(e)** | horizontal line from C (100 m) from 60 s to 80 s; | 1 | |
| **3(a)** | acceleration; | 1 | allow: rate of change of speed / velocity |
| **3(b)** | a = change in speed / time **or** 20 / 10;<br>2.0 $m/s^2$; | 2 | unit required for M2 |
| **3(c)** | decelerating at a constant rate / slowing down steadily (to rest); | 1 | allow: constant deceleration until it stops |
| **3(d)** | area under graph (idea);<br>½ × 10 × 20 + 20 × 20 + ½ × 10 × 20 **or** 100 + 400 + 100;<br>600 (m); | 3 | allow trapezium method: ½ × (40 + 20) × 20<br>correct answer with no working: 3 marks |



Original practice questions © Your Science Online (yourscienceonline.com). This is not an official Cambridge paper.

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| **3(e)** | 600 / 40;<br>15 (m/s); | 2 | ecf from (d) |
| **4(a)** | 9.8 m/s$^2$; | 1 | allow 10 m/s$^2$; unit needed |
| **4(b)** | weight stays the same / constant;<br>air resistance increases as speed increases;<br>resultant (downward) force decreases (so acceleration decreases); | 3 | do not allow: "gravity decreases" |
| **4(c)** | zero **and** terminal velocity; | 1 | both needed |
| **4(d)** | speed decreases;<br>air resistance (much) larger than weight / resultant force upwards;<br>as speed decreases air resistance decreases until it equals weight, then constant (lower) speed / new terminal velocity; | 3 | |
| **5(a)** | (30 – 12) / 45 **or** 18 / 45;<br>0.40 (m/s$^2$); | 2 | allow –0.40 m/s$^2$ |
| **5(b)** | average speed = (30 + 12) / 2 = 21 (m/s) **or** area under speed–time graph;<br>21 × 45 = 950 (m); | 2 | allow 945 m |
| **5(c)** | not correct / velocity is changing;<br>direction (of motion) is changing (and velocity has direction); | 2 | reason needed for M2: "speed is changing" scores 0 |
| **6(a)** | suitable use of axes (already labelled) and all six points plotted correctly (to within half a small square);<br>straight best-fit line through (or close to) the origin; | 3 | all six points = 2; four or five = 1<br>line must be ruled and single |
| **6(b)** | gradient from large triangle, e.g. 4.9 / 0.50;<br>9.6–10 (m/s$^2$); | 2 | ecf from line drawn |
| **6(c)** | acceleration of free fall / acceleration due to gravity / g; | 1 | |
| **6(d)** | air resistance is larger compared with its weight / not negligible for a light ball; | 1 | allow: air resistance has a bigger effect |



Original practice questions © Your Science Online (yourscienceonline.com). This is not an official Cambridge paper.