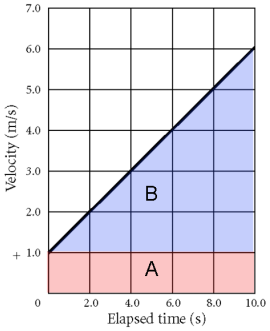
Assess Quizzes from the o-book – Explanations for the answers.

Chapter 10 Review – Support

Q	Reason
1	*Displacement* is the correct answer as it has both magnitude and direction. *Kilometres per hour* is not a quantity but is a unit for speed; *metres per second* is a unit; *distance* is a scalar quantity
2	Words and symbols like *down, upwards, +/-* indicate direction so may make the measurement represent a vector quantity (which has direction as well as magnitude).
3	At rest when its displacement does not change. Hence, from 5.0 to 10.0 s
4	Fastest speed will have greatest slope for a s/t graph. Looks like from 10.0 s to 15.0 s. The slope (gradient) is: $v = \frac{s}{t} = \frac{1-3}{15-10} = \frac{-2}{5} = -0.4\,m\,s^{-1}$ $Speed = 0.4\,m\,s^{-1}\ [no\ direction]$
5	See page 289.
6	Positive velocity could mean the car is moving to the right (the + direction). Negative acceleration means the net force is in the negative direction (to the left). This means that the car must be slowing down. Note however that the choice of +/- direction is arbitrary but is fairly conventional to make right the + direction. Note also that once the car slows to zero it would then speed up in the negative direction provided the force remained in the negative direction. If the negative acceleration was due to friction, once the car stopped it would not continue in the negative direction as friction would also be zero.
7	A linear v/t graph implies constant velocity.
8	 Area of bottom rectangle (A) = 10 × 10 = 100 m. Area of triangle (B) above it = (10 × 50)/2 = 250 m. Total displacement = 100 + 250 = 350 m.
9	All three are true as the net force on the ball (gravity) is constant so acceleration is constant both in magnitude and direction.
10	All three are correct. Note thought that it is not a vector quantity so has no direction included.

Assess Quizzes from the o-book – Explanations for the answers.

Chapter 10 Review – Consolidate

Q	Reason
1	$v = \frac{s}{t} = \frac{12\,cm}{60\,s} = \frac{120\,mm}{60\,s} = 2\,mm\,s^{-1}$
2	It means the car is moving in the negative direction (could be defined a moving to the left). It is also accelerating in the negative direction. This means the net force is in the negative direction so will be getting faster in the negative direction as its velocity is in the same direction. So – the car speeds up. Don't get confused by thinking a negative acceleration means slowing down. It would if the velocity was in the + direction.
3	There is a constant acceleration downwards as the net force is downwards. Velocity increases in the negative direction.
4	$s = ut + \frac{1}{2}at^2$ $-30 = 0 + \frac{1}{2}a \times 2.6^2$ $-60 = a \times 2.6^2$ $a = \frac{-60}{2.6^2} = -8.9\,m\,s^{-2}$ (*ignore the negative*)
5	$a_1 = \frac{v-u}{t} = \frac{20-15}{1} = 5\,m\,s^{-2}$ $a_2 = \frac{v-u}{t} = \frac{25-20}{1} = 5\,m\,s^{-2}$ Uniform acceleration as it is not changing (same direction and magnitude)

Assess Quizzes from the o-book – Explanations for the answers.

Chapter 10 Review – Extend

Q	Reason
1	$s_{final} = s_f - s_i = 50 - (-50) = +100\,m$ $v_{av} = \frac{s}{t} = \frac{s_f - s_i}{t} = \frac{50-(-50)}{10} = \frac{+100}{10} = +10\,m\,s^{-1}$
2	There is no correct option. The option that has 5.4 s is supposed to read 1.5 s. $s = ut + \frac{1}{2}at^2$ $s = \frac{1}{2}at^2\,[from\ rest]$ $t = \sqrt{\frac{2s}{a}}$ $t_M = \sqrt{\frac{2\times5}{1.6}} = 2.5\,s$ $t_E = \sqrt{\frac{2\times5}{9.8}} = 1.0\,s$ $\Delta t = 2.5 - 1.0 = 1.5\,s$
3	$a = \frac{v-u}{t} = \frac{-20-(+20)}{4} = \frac{-40}{4} = -10\,m\,s^{-2}$
4	Distance = absolute area = $\frac{2\times20}{2} + \frac{2\times20}{2} = 40\,m$ Displacement = area (using +/-) = $\frac{2\times20}{2} + \frac{2\times(-20)}{2} = 0\,m$
5	After 3 s: Distance = absolute area = $\frac{2\times20}{2} + \frac{1\times10}{2} = 25\,m$ Displacement = area (using +/-) = $\frac{2\times20}{2} + \frac{1\times(-10)}{2} = 15\,m$