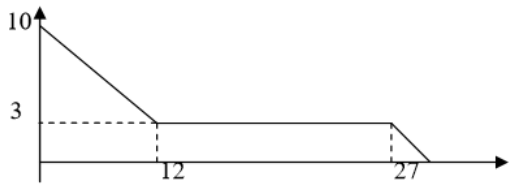
# Travel Graphs - Edexcel Past Exam Questions MARK SCHEME

**Question 1: Jan 05 Q3**

| Question Number | Scheme | Marks |
|---|---|---|
| | (a) Distance = ½ x 4 x 9 + 16 x 9 **or** ½ (20 + 16) x 9 | M1 |
| | = 162 m | A1 (2) |
| | (b) Distance over last 5 s = ½(9 + $u$) x 5 | M1 |
| | 162 + ½(9 + $u$) x 5 = 200 | M1 A1√ |
| | $\Rightarrow u$ = 6.2 m s$^{-1}$ | A1 (4) |
| | (c) 6.2 = 9 + 5$a$ | M1 A1√ |
| | $a$ = (–) 0.56 m s$^{-2}$ | A1 (3) |

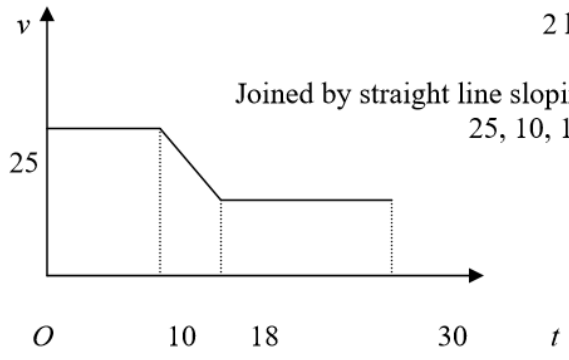
## Question 2: June 05 Q5

| | | |
|---|---|---|
| | (a)   Shape $0 < t < 12$ | B1 |
| | Shape $t > 12$ | B1 |
| | Figures | B1 (3) |
| | (b) Distance in 1st 12 s = ½ x (10 + 3) x 12 *or* (3 x 12) + ½ x 3 x 7 | M1 |
| | = 78 m | A1 (2) |
| | (c) **either**<br>distance from $t = 12$ to $t = 27 = 15 \times 3 = 45$<br>$\therefore$ distance in last section = 135 – 45 = 12 m | B1√ |
| | ½ x 3 x $t$ = 12, | M1 A1√ |
| | $\Rightarrow t = 8$ s | A1 |
| | hence total time = 27 + 8 = 35 s | A1 (5) |
| | **or** Distance remaining after 12 s = 135 – 78 = 57 m | B1√ |
| | ½ x (15 + 15 + $t$) x 3 = 57 | M1 A1√ |
| | $\Rightarrow t = 8$ | A1 |
| | Hence total time = 27 + 8 = 35 s | A1 |

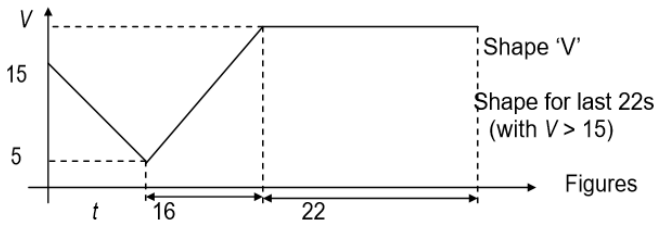
## Question 3: June 06 Q1

| Question Number | Scheme | Marks |
|---|---|---|
| | (a) Constant acceleration | B1 (1) |
| | (b) Constant speed/velocity | B1 (1) |
| | (c) Distance = ½ (2 + 5) x 3, + (4 x 5) | M1 A1, B1 |
| | = 30.5 m | A1 (4) |
| | (a) and (b) Accept 'steady' instead of 'constant. Allow 'o.e.' (= 'or equivalent') within reason! But must have idea of constant.<br>'constant speed and constant acceleration' for (a) or (b) is B0<br><br>(c) M1 for valid attempt at area of *this* trap. as area of a trap. Or this trap. as = triangle + rectangle, i.e. correct formula used with at most a slip in numbers.<br><br>B1 for area of rectangle as 5 x 4<br><br>Treating whole as a single const acceln situation, or whole as a single trapezium, is M0.<br><br>If assume that top speed is 5.1 or 5.2, allow full marks on f.t. basis (but must be consistent) | |

## Question 4: June 07 Q4

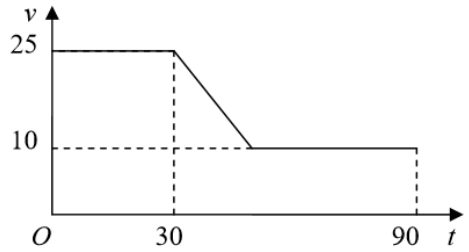
| | | |
|---|---|---|
| | (a) lines   2 horizontal<br>Joined by straight line sloping down<br>25, 10, 18, 30 oe | B1<br>B1<br>B1 (3) |
| | (b) $25\times10+\frac{1}{2}(25+V)\times8+12\times V=526$<br>Solving to $V=11$ | M1 A1 A1<br>DM1 A1 (5) |
| | (c) "$v=u+at$" $\Rightarrow$ $11=25-8a$ ft their $V$<br>$a=1.75$ $\left(\text{m s}^{-2}\right)$ | M1 A1ft<br>A1 (3) |
| | | [11] |

## Question 5: Jan 08 Q3

| Question Number | Scheme | Marks |
|---|---|---|
| (a) |  | B1<br>B1<br>B1 (3) |
| (b) | $\frac{1}{2}(15+5) \times t = 120$<br>$\Rightarrow t = 12 \rightarrow T = 12 + 16 + 22 = \underline{50\text{ s}}$ | M1<br>M1 A1 (3) |
| (c) | $120 + \underline{\frac{1}{2}(V+5).16} + 22V = 1000$<br>Solve: $30V = 840 \Rightarrow V = \underline{28}$ | M1 B1 A1<br>DM1 A1<br>(5)<br>**11** |

## Question 6: June 08 Q4

(a)




shape B1
25, 10, 30, 90 B1 **(2)**

(b) $30 \times 25 + \underline{\frac{1}{2}(25+10)t} + 10(60-t) = 1410$ M1 A1 A1

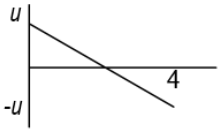
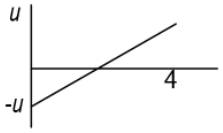
$7.5t = 60$

$t = 8\ (\text{s})$ DM1 A1

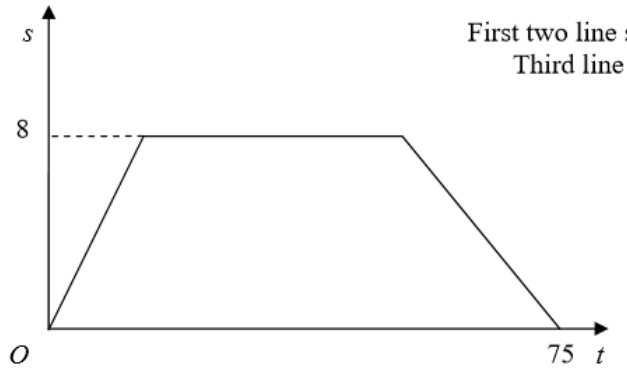
$a = \frac{25-10}{8} = 1.875\ (\text{ms}^{-2})$ $1\frac{7}{8}$ M1 A1 **(7)**

**[9]**

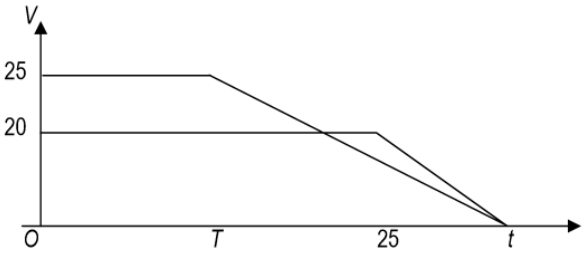
## Question 7: Jan 09 Q2

| | | | |
|---|---|---|---|
| (a) |   or   | shape<br>values | B1<br>B1 (2) |
| (b) | $19.6 = \frac{1}{2} \times 2 \times u$<br>$u = 19.6$ | | M1 A1<br>A1 (3)<br>**[5]** |

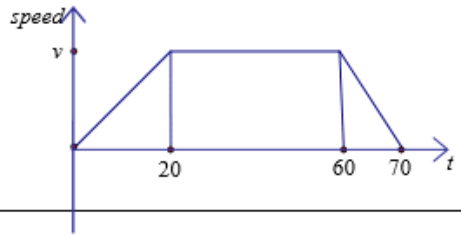
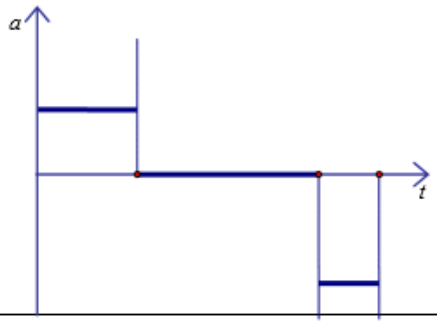
## Question 8: Jan 10 Q2

| | | | |
|---|---|---|---|
| | (a)   | First two line segments<br>Third line segment<br>8, 75 | B1<br>B1<br>B1 (3) |
| | (b) $\frac{1}{2} \times 8 \times (T + 75) = 500$<br>Solving to $T = 50$ | | M1 A2 (1,0)<br>DM1 A1 (5)<br>**[8]** |

## Question 9: June 10 Q5

| | | | |
|---|---|---|---|
| (a) |  | Shape (both)<br>Cross<br>Meet on $t$-axis<br>Figures 25,20,$T$,25 | B1<br>B1<br>B1<br>B1<br>(4) |
| (b) | For $Q$: $20\left(\frac{t+25}{2}\right)=800$<br>$t=55$ | | M1 A1<br>DM1 A1 |
| | For $P$: $25\left(\frac{T+55}{2}\right)=800$<br>solving for $T$: $T=9$ | | M1 A1<br>DM1 A1 (8)<br>**[12]** |

## Question 10: Jan 11 Q5

| Question Number | Scheme | Marks |
|---|---|---|
| **(a) (i)** |  <br>1st section correct<br>2nd & 3rd sections correct<br>Numbers and v marked correctly on the axes. | B1<br>B1<br>DB1 |
| **(ii)** |  <br>1st section correct<br>2nd section correct<br>3rd section correct and no "extras" on the sketch | B1<br>B1<br>B1<br>(6) |
| **(b)** | $\frac{70+40}{2}\times v=880$<br>$v=880\times\frac{2}{110}=16$ | M1 A1<br>DM1 A1<br>(4)<br>**[10]** |