

Doubles Tracking Test 2 part B
(37 marks 44 minutes)

Name: _____

Teacher: _____

Probability

$$P(A') = 1 - P(A)$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(A \cap B) = P(A)P(B | A)$$

$$P(A | B) = \frac{P(B | A)P(A)}{P(B | A)P(A) + P(B | A')P(A')}$$

For independent events A and B ,

$$P(B | A) = P(B)$$

$$P(A | B) = P(A)$$

$$P(A \cap B) = P(A) P(B)$$

Kinematics

For motion in a straight line with constant acceleration:

$$v = u + at$$

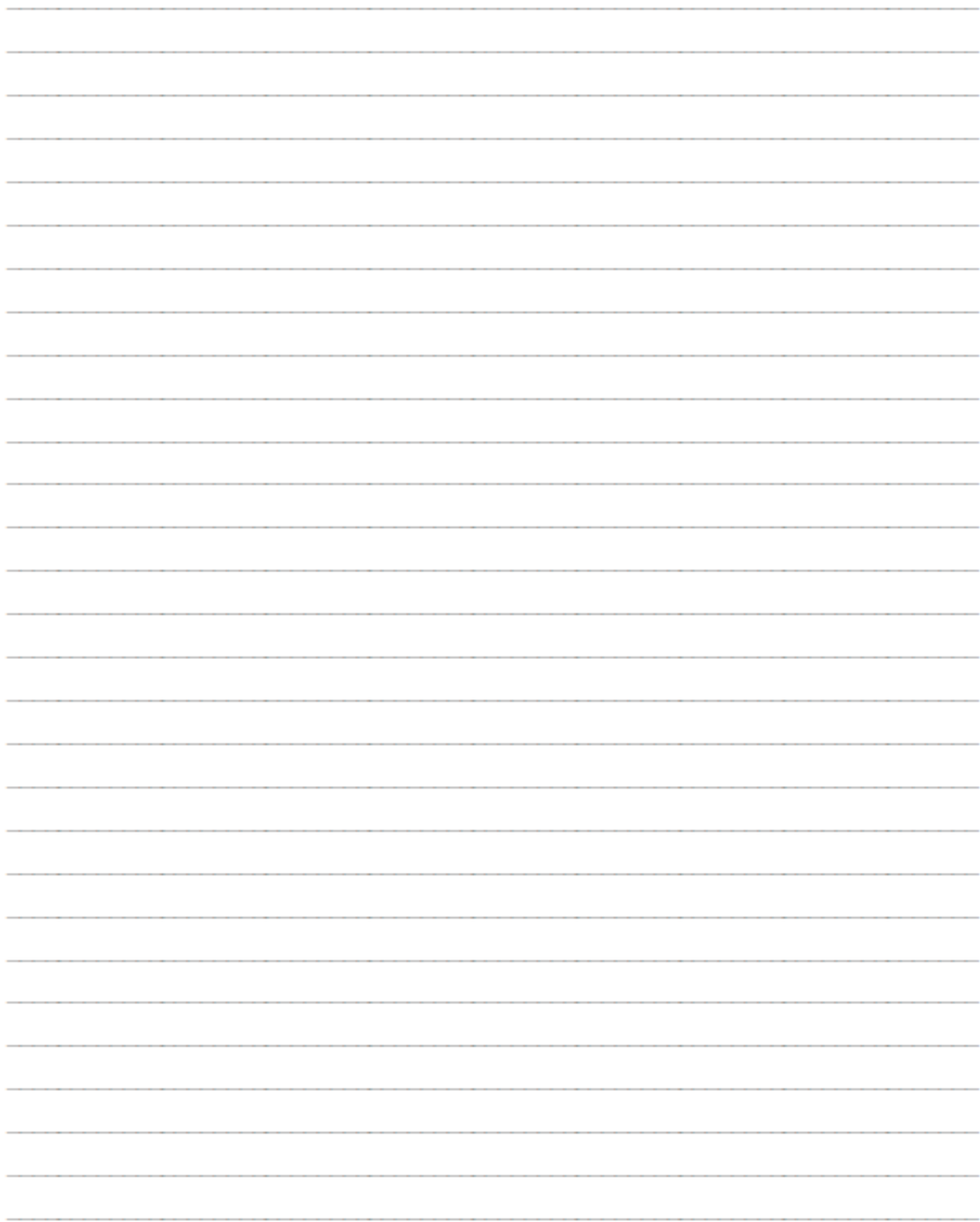
$$s = ut + \frac{1}{2}at^2$$

$$s = vt - \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

$$s = \frac{1}{2}(u + v)t$$







(a) $P(A \cup B) = 0.35 + 0.45 - 0.13$ or $0.22 + 0.13 + 0.32$
 $= \underline{0.67}$

M1
A1

(2)

(b) $P(A' | B') = \frac{P(A' \cap B')}{P(B')}$ or $\frac{0.33}{0.55}$
 $= \frac{3}{5}$ or 0.6

M1

A1

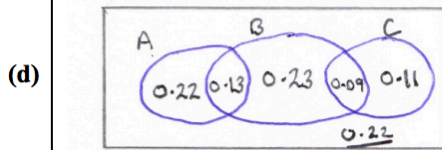
(2)

(c) $P(B \cap C) = 0.45 \times 0.2$
 $= \underline{0.09}$

M1

A1

(2)



Allow 1st B1 for 3 intersecting circles in a box with zeros in the regions for $A \cap C$
 Do not accept "blank" for zero

B1
B1ft
B1
B1

(4)

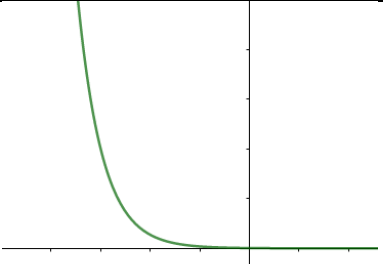
(e) $P(B \cup C)' = 0.22 + \underline{0.22}$ or $1 - [0.56]$ or $1 - [0.13 + 0.23 + 0.09 + 0.11]$ o.e.
 $= \underline{0.44}$

M1

A1

(2)

12

2a		B1 exponential shape B1 correct graph
2b	$10 = ke^{-0.01t}$ $k = 10$ $2.5 = 10e^{-0.01t}$ $\frac{1}{4} = e^{-0.01t}$ $\frac{1}{4} = e^{-0.01t}$ $t = 100 \ln 4 \text{ or } 139$	M1 attempt to find k A1 correct k M1 M1 A1
3a	$-1 = 12.5t - 4.9t^2$ $t = 2.628$ $s = \left(\frac{25\sqrt{3}}{2}\right) 2.628$ $= 57$	M1A1 A1 M1 A1
3b	$v = 12.5 - 9.8(2.628)$ $= -13.25$ $V^2 = (-13.75)^2 + \left(\frac{25\sqrt{3}}{2}\right)^2$ $V = 25$	B1 12.5 M1A1 M1A1 A1
4	$60 = T_1 \sin 40 + T_2 \sin 20$ $T_1 \cos 40 = T_2 \cos 20$ $T_1 = 53$ $T_2 = 65$	M1 Resolving M1A1 M1A1 M1A1