

1. (a)  $\frac{0+6}{2} = 3 \quad h = 3$  (M1)(A1) (C2)

*Note: Award (M1) for any correct method.*

(b)  $y = ax(x - 6)$  (A1)

$8 = 3a(-3)$  (A1)(ft)

$a = -\frac{8}{9}$  (A1)(ft)

$y = -\frac{8}{9}x(x - 6)$  (A1)(ft)

*Notes: Award (A1) for correct substitution of  $b = 6$  into equation.*

*Award (A1)(ft) for substitution of their point  $V$  into the equation.*

**OR**

$y = a(x - 3)^2 + 8$  (A1)(ft)

*Note: Award (A1)(ft) for correct substitution of their  $h$  into the equation.*

$0 = a(6 - 3)^2 + 8$  **OR**  $0 = a(0 - 3)^2 + 8$  (A1)

*Note: Award (A1) for correct substitution of an  $x$ -intercept.*

$a = -\frac{8}{9}$  (A1)(ft)

$y = -\frac{8}{9}(x - 3)^2 + 8$  (A1)(ft) (C4)

**[6]**

2. (a)  $y = x(5 - x)$  or  $y = 5x - x^2$  or  $25 = c + 5k$  (M1)  
 $c = 0, k = 5$  (A1)(A1) (C3)

*Note: Award (A1) if no method is indicated but  $c = 0$  or  $k = 5$  is given alone.*

(b) Vertex at  $x = \frac{-b}{2a} = \frac{-5}{-2} = 2.5$  (M1)(A1)

$y = 5(2.5) - 2.5^2 = 6.25$  (M1)(A1)

**Note:** The substitutions must be attempted to receive the method marks.

Q(2.5, 6.25) (A1) (C5)

**Notes:** Coordinate pair is required for (A1) but Q is not essential. If no working shown and answer not fully correct, award (G2) for each correct value and (A1) for coordinate brackets. However, if values are close but not exactly correct (eg (2.49, 6.25)) award only (G1) for each less precise value. In this case AP might also apply if number of digits is inappropriate.

If differentiation is used, award (M1) for correct process, (A1) for  $x = 2.5$ , (M1)(A1) or (G2) for 6.25 and (A1) for coordinate brackets.

[8]

3. (a) 3 (A1)

(b) For 5, 4, 7 (0) seen with no extra values (A1)  
16 (A1)(G2)

(c) They like (both) the *Salseros* (S) **and** they like the *Bluers* (B) (A1)(A1)  
**Note:** Award (A1) for “and”, (A1) for the correct groups.

(d)  $R \cap B \cap S'$  (A1)(A1)  
**Note:** Award (A1) for  $R \cap B$ , (A1) for  $\cap S'$

(e) (i)  $21 + 3x = 33$  (M1)  
 $x = 4$  (A1)(G2)

(ii) 17 (A1)(ft)

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4. (a)

$p$	$q$	$p \vee q$	$\neg(p \vee q)$
T	T	<b>T</b>	<b>F</b>
T	F	<b>T</b>	<b>F</b>
F	T	<b>T</b>	<b>F</b>
F	F	<b>F</b>	<b>T</b>

(A1)

(A1)(ft)

*Note:* (A1) for each correct column

(C2)

(b) It is not true that food or drinks may be taken into the cinema.

*Note:* (A1) for “it is not true”. (A1) for “food or drinks”.

**OR**

Neither food nor drinks may be taken into the cinema.

*Note:* (A1) for “neither”. (A1) for “nor”.

**OR**

No food and no drinks may be taken into the cinema.

*Note:* (A1) for “no food”, “no drinks”. (A1) for “and”.

**OR**

No food or drink may be brought into the cinema.

(A2) (C2)

*Note:* (A1) for “no”, (A1) for “food or drink”

Do not penalize for use of plural / singular

*Note:* the following answers are incorrect:

No food **and** drink may be brought into the cinema. Award

(A1)(A0)

Food **and** drink may not be brought into the cinema. Award

(A1)(A0)

No food **or** no drink may be brought into the cinema. Award

(A1)(A0)

(c)  $\neg p \wedge \neg q$

*Note:* (A1) for both negations, (A1) for conjunction.

**OR**

$\neg(p \vee q)$

(A1)(A1) (C2)

*Note:* (A1) for negation, (A1) for  $p \vee q$  in parentheses.

[6]

5. (a)  $u_{96} = u_1 + 95d$

(M1)

$= 0 + 95 \times 12$

$= 1140$

(A1) (C2)

- (b)  $6r^5 = 16d$  (A1)  
 $6r^5 = 16 \times 12$  (192) (A1)  
*Note: (A1) only, if both terms seen without an equation.* (C2)

- (c)  $r^5 = 32$  (A1)(ft)  
*Note: (ft) from their (b)*  
 $r = 2$  (A1)(ft) (C2)

[6]

6. (a) 0.965 (A1) (C1)

- (b)  $y = 1.15x + 0.976$   
(A1) for 1.15x (A1) for +0.976 (A1)(A1) (C2)

- (c)  $y = 1.15(7) + 0.976$  (M1)  
Chemistry = 9.03 (accept 9) (A1)(ft) (C2)  
*Note: Follow through from candidate's answer to (b) even if no working is seen. Award (A2)(ft).*

- (d) the correlation coefficient is close to 1  
**OR** strongly correlated variables  
**OR** 7 lies within the range of physics marks. (R1) (C1)

[6]