Simultaneous Eq Ans

0 min
0 marks

1. (a) (i) $\frac{0-2}{6-0}$ (M1)

$= -\frac{1}{3}\left(-\frac{2}{6}, -0.333\right)$ (A1) (C2)

(ii) $y = -\frac{1}{3}x + 2$ (A1)(ft) (C1)

Notes: *Follow through from their gradient in part (a)(i).*
Accept equivalent forms for the equation of a line.

(b) area $= \frac{6 \times 1.5}{2}$ (A1)(M1)

Note: *Award (A1) for 1.5 seen, (M1) for use of triangle formula with 6 seen.*

$= 4.5$ (A1) (C3)

[6]

2. (a) Thursday's sales, $6b + 9m = 23.40$ (A1)

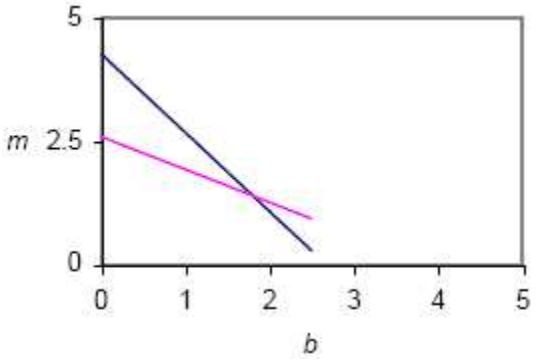
$2b + 3m = 7.80$ (A1) (C2)

(b) $m = 1.40$ *(accept 1.4)* (A1)(ft)

$b = 1.80$ *(accept 1.8)* (A1)(ft) (C2)

Note: *Award (A1)(d) for a reasonable attempt to solve by hand and answer incorrect.*

(c)



(A1)(A1)(ft) (C2)

Notes: *(A1) each for two reasonable straight lines. The intersection point must be approximately correct to earn both marks, otherwise penalize at least one line.*

The follow through mark is for candidate's line from (a).

[6]

3. (a) $y = -2x + 8$ (M1)

Note: *Award (M1) for rearrangement of equation or for –2 seen.*

$m(\text{perp}) = \frac{1}{2}$ (A1) (C2)

(b) (i) $2(4) + k - 8 = 0$ (M1)

Note: *Award (M1) for evidence of substituting $x = 4$ into R_1.*

$k = 0$ (A1) (C2)

(ii) $y = \frac{1}{2}x + c$ (*can be implied*) (M1)

Note: *Award (M1) for substitution of* $\frac{1}{2}$ *into equation of the line.*

$0 = \frac{1}{2}(4) + c$

$y = \frac{1}{2}x - 2$ (A1)(ft) (C2)

Notes: *Follow through from parts (a) and (b)(i). Accept equivalent forms for the equation of a line.*

OR

$y - y_1 = \frac{1}{2}(x - x_1)$ (M1)

Note: *Award (M1) for substitution of* $\frac{1}{2}$ *into equation of the line.*

$y = \frac{1}{2}(x - 4)$ (A1)(ft) (C2)

Notes: *Follow through from parts (a) and (b)(i). Accept equivalent forms for the equation of a line.*

[6]

4. (a) $4a + 2b = 20$
$a + b = 8$ (A1)
$a - b = -4$ (A1) (C2)

Note: *Award (A1)(A1) for any two of the given or equivalent equations.*

(b) (i) $a = 2$ (A1)(ft)

(ii) $b = 6$ (A1)(ft) (C2)

Note: *Follow through from their (a).*

(c) $x = -\frac{6}{2(2)}$ (M1)

Note: *Award (M1) for correct substitution in correct formula.*

$= -1.5$ (A1)(ft) (C2)

[6]

5. (a) $p + q = 47$ (A1)

$4p + q = 53$ (A1) (C2)

(b) Reasonable attempt to solve their equations (M1)

$p = 2, q = 45$ (A1) (C2)

Note: *Accept only the answers p = 2, q = 45.*

(c) $C = 2 \times 2^{0.5(10)} + 45$ (M1)

$C = 109$ (A1)(ft) (C2)

Note: *Award (M1) for substitution of 10 into the formula with their values of p and q.*

[6]

6. (a) $6C+3V = 163.17$ (A1)

$9C+2V = 200.53$ (A1) (C2)

Note: *If **both** addition signs missing, award (A0)(A1)(ft)*

(b) *GDC use is expected.*

Solve simultaneously to find V = \$17.69 (\$17.7) (M1)(A1)(ft) (C2)

\$18.35 here receives (A0)

Note: *A reasonable attempt to solve on paper without the GDC can receive (M1).*

(c) $9 \times 18.35 = 165.15$ (M1)

$180 - 165.15$

$= \$14.85$ ($14.9) (A1)(ft) (C2)

Note: *If C and V are reversed in (b) and (c) all the marks can be treated as (ft) in (c), however, if the same wrong answer for C appears in both (b) and (c) then (c) can receive at most (M1)(A0). In the former case the answers are $159.21 and $20.79 respectively.*

[6]

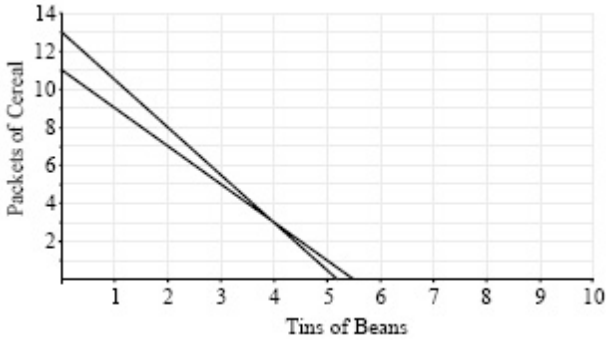
7. (a) $50b + 20c = 260$ (A1)

(b) $12b + 6c = 66$ (A1)

(c) Solve to get $b = 4$ (M1)(A1)(ft)(G2)

Note: *(M1) for attempting to solve the equations simultaneously*

(d) (i)



(A1)(A1)(A1)

Notes: *Award (A1) for labels and some idea of scale, (A1)(ft)(A1)(ft) for each line*
The axis can be reversed

(ii) (4, 3) or (3, 4) (A1)(ft)

Note: *Accept $b = 4$, $c = 3$*

[8]

8. (a) $p + q = 6$ (A1)

$0.5p + q = 4$ (A1) (C2)

Note: *Accept correct equivalent forms of the equations.*

(b) $p = 4, q = 2$ (A1)(A1)(ft) (C2)

Notes: *If both answers are incorrect, award (M1) for attempt at solving simultaneous equations.*

(c) $y = 2$ (A1)(A1)(ft) (C2)

Notes: *Award (A1) for "y = a constant", (A1)(ft) for 2. Follow through from their value for q as long as their constant is greater than 2 and less than 6.*
An equation must be seen for any marks to be awarded.

[6]

9. (a) $2925 = 12r + s$ (M2)
$4525 = 20r + s$ (M2)

$1600 = 8r$
$200 = r$ (A2) (C6)

(b) $2925 = 12(200) + s$
$525 = s$ (A2) (C2)

Note: *Award (C2)(C2) if the candidate correctly solves an incorrect system of equations.*

[8]

10. (a) $x + y = 10000$ (A1) (C1)

(b) $2 \times 12 + 3 \times 5$ (M1)

39 (39.0, 39.00) (AUD) (A1) (C2)

(c) $12x + 5y = 108800$ (A1) (C1)

(d) $x = 8400, y = 1600$ (A1)(ft)(A1)(ft) (C2)

Notes: *Follow through from their equations.*
If x and y are both incorrect then award (M1) for attempting to solve simultaneous equations.

[6]