

# Applied Mathematics B – Solutions (Section A & B)

## SECTION A – Answers

- Q1: c
- Q2: a
- Q3: b
- Q4: b
- Q5: a
- Q6: c
- Q7: a
- Q8: b
- Q9: b
- Q10: c
- Q11: b
- Q12: d
- Q13: b
- Q14: c
- Q15:  $\det(A) = \det(A^T)$

## SECTION B – Solutions

### Question 16

Given:  $y = x(4 - x) = 4x - x^2$

Vertex at (2,4); intercepts at (0,0) and (4,0).

Area between curve and x-axis from 0 to 5:

Area = 13 units<sup>2</sup>

### Question 17

$$f(x) = (x^2 - x + 2)/(x - 1)$$

Domain:  $x \neq 1$

Vertical asymptote:  $x = 1$

Oblique asymptote:  $y = x$

Critical points:  $x = 0, 2$

### Question 18

Total outcomes = 9 combinations of food and drink.

**Question 19**

Mean  $x = 17.5$ , Mean  $y = 50$

Correlation  $\approx -0.96$  (strong negative)

**Question 20**

a)  $3i = 3(\cos \pi/2 + i \sin \pi/2)$

b)  $-2 = 2(\cos \pi + i \sin \pi)$

c)  $5i = 5(\cos \pi/2 + i \sin \pi/2)$