



# 2021 VCE Further Mathematics 1 (NHT) examination report

## Specific information

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

The tables below indicate the correct answer for each question.

## Section A – Core

### Data analysis

| Question | Answer |
|----------|--------|
| 1        | B      |
| 2        | C      |
| 3        | C      |
| 4        | D      |
| 5        | B      |
| 6        | E      |
| 7        | C      |
| 8        | A      |
| 9        | E      |
| 10       | B      |
| 11       | A      |
| 12       | B      |
| 13       | E      |
| 14       | D      |
| 15       | D      |
| 16       | B      |

## Question 4

To calculate the mean score for the whole class the total scores for the 15 girls and total score for the 10 boys need to be determined.

$$\text{Total (Girls)} = 28.5 \times 15 = 427.5, \text{ Total (Boys)} = 25.5 \times 10 = 255, \text{ Total (Girls + Boys)} = 682.5$$

$$\text{The mean for the entire group} = \frac{682.5}{15+10} = 27.3 \text{ (option D)}$$

## Question 8

The percentage of people who have high blood pressure and are in the 70–79 years age group.

$$\frac{37}{180} = 21\% \text{ (option A)}$$

## Question 9

The percentage of the people in the 60-69 years age group who have normal blood pressure.

$$\frac{42}{80} = 53\% \text{ (option E)}$$

## Recursion and financial modelling

| Question | Answer |
|----------|--------|
| 17       | A      |
| 18       |        |
| 19       | D      |
| 20       | D      |
| 21       | B      |
| 22       | C      |
| 23       | C      |
| 24       | B      |

## Question 18

As a result of psychometric analysis, the question was invalidated.

## Question 23

The annual interest rate is 6.35%. The effective interest rate is  $\left( \left( 1 + \frac{6.35}{100} \right)^4 - 1 \right) = 6.50\%$  (option C).

## Section 2 – Modules

### Module 1 – Matrices

| Question | Answer |
|----------|--------|
| 1        | E      |
| 2        | B      |
| 3        | D      |
| 4        | C      |
| 5        | C      |
| 6        | C      |
| 7        | D      |
| 8        | A      |

### Question 3

The given matrix equation has solutions  $x = \frac{17}{5}$  and  $y = \frac{7}{10}$

The simultaneous equations representing this matrix equation are:

$$4x + 2y = 15$$

$$2x - 4y = 4$$

Option A

$$2y - 4x = 15$$

$$4y + 2x = 4$$

Option B

$$2y - 4x = 4$$

$$4y + 2x = 15$$

Option C

$$2y + 4x = -4$$

$$-4y + 2y = -15$$

Option D

$$\begin{array}{lcl} 4x + 2y = 15 & & 4x + 2y = 15 \\ & = & \\ 8x - 16y = 16 & & 2x - 4y = 4 \end{array} \quad \text{(correct option)}$$

Option E

$$-4x + 2y = 15$$

$$2x + 4y = 4$$

### Question 5

$$G = 36$$

$$0.52 \times 36 + 0.24 \times W = 36, W = 72 \text{ (option C)}$$

## Module 2 – Networks and decision mathematics

| Question | Answer |
|----------|--------|
| 1        | D      |
| 2        | B      |
| 3        | E      |
| 4        | A      |
| 5        | C      |
| 6        | B      |
| 7        | D      |
| 8        | B      |

### Question 8

The Holiday Fun network has a minimum completion time of 28 hours and critical path ADGKL.

The Sunny Life network has a minimum completion time of 27 hours and a critical path AEIJL or BGKL.

Sunny Life has a completion time one hour less than the Holiday Fun caravan (option B).

## Module 3 – Geometry and measurement

| Question | Answer |
|----------|--------|
| 1        | D      |
| 2        | D      |
| 3        | B      |
| 4        | A      |
| 5        | B      |
| 6        | A      |
| 7        | D      |
| 8        | E      |

## Module 4 – Graphs and relations

| Question | Answer |
|----------|--------|
| 1        | C      |
| 2        | D      |
| 3        | B      |
| 4        | E      |
| 5        | D      |
| 6        | B      |
| 7        | D      |
| 8        | C      |

### Question 7

From 0 to  $p$  minutes the tank is being emptied at a rate of 50 litres/min. Therefore  $p = 16$

From  $p$  to 29 minutes the tank is being emptied at a rate of  $\frac{400}{29-16} = 31$  litres/min (option D)

### Question 8

Point R is the intersection of  $y = 8 - x$  and  $y = 6 - \frac{x}{3}$

The gradient,  $m$ , of the objective function must be between  $-1 < m < -\frac{1}{3}$  (option C).