

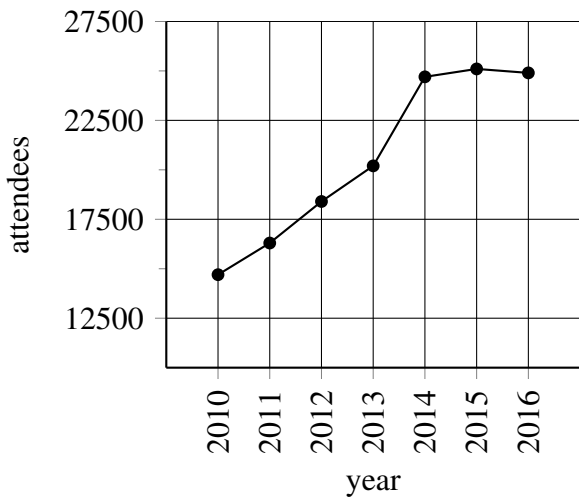
# SOLUTIONS

## Fortify Sample Exam 2A

### Section A - Data analysis

#### Question 1

a.



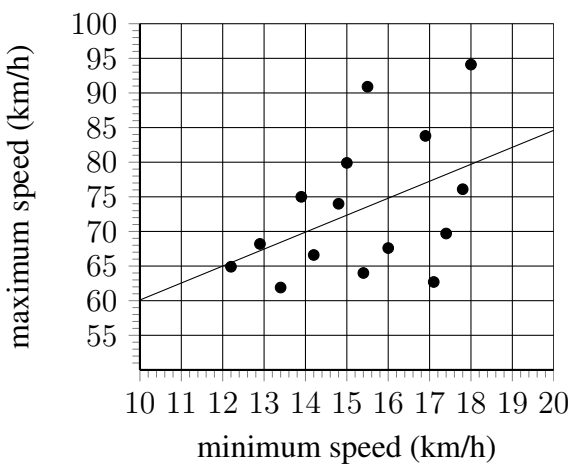
b. Increasing trend.

c. attendees = 14775 + 1946 × time

d. -2097

#### Question 2

a.



b. On average, it is predicted that when the minimum speed is 0 km/h the maximum speed is 35.6 km/h.

c. Weak, positive.

d. On average, it is predicted that the maximum speed increases by 2.45 km/h for every 1 km/h increase in minimum speed.

e. 20%

f. 2.1

#### Question 3

ai. 22.1 years

aii. 19.7 years

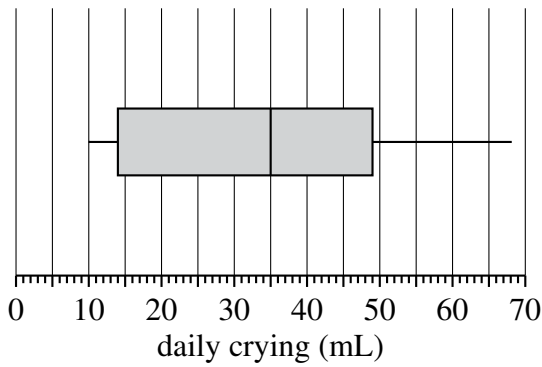
b.  $IQR = 1.7$

c. Check with your teacher.

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**Question 4**


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**ai.****aii.** 25%

**bi.** September: The distribution is symmetric with no outliers.

October: The distribution is negatively skewed with outliers.

**bii.** 107.5

**biii.** The median amount of daily crying increases from 80mL in September to 166mL in October.

**Section A - Recursion and financial modelling**


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**Question 5**


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**a.**  $V_0 = 235$

$$V_1 = 235 - 39.95 = 195.05$$

$$V_2 = 195.05 - 39.95 = 155.10$$

**bi.** Depreciation = \$39.95 per year

**bii.** Flat rate of depreciation = 17%

**c.** Recurring balance depreciation = 21%

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**Question 6**


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**a.** Interest earned = \$8,750

**b.** Annual rate of interest = 8.6%

**ci.** 0.009 and 420

**cii.** Balance = \$27,615

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**Question 7**


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**a.** Initial investment = \$388,350

**b.** Evan and Zoe will never have to invest more, as a perpetuity only pays out interest earned.

**Section B - Module 1 - Matrices**

**Question 1**

- a.  $4 \times 1$  or  $4$  by  $1$
- bi.  $[4545]$
- bii. The total value of the cash in the safe.

**Question 2**

- ai.  $5\%$
- aii.  $15\%$
- b.  $4,250$
- ci.
 
$$S_4 = \begin{bmatrix} 18138 \\ 46286 \\ 80576 \end{bmatrix}$$
- cii. The expected approval preferences of citizens in April 2018.

**Question 3**

- a. 477 Champagnes
- b. The number of sliders sold in the second round (112).
- ci. \$11.30
- cii.  $Y = \begin{bmatrix} 1 & 0 & 1 \end{bmatrix}$

**Section B - Module 2 - Networks and decision mathematics**

**Question 1**

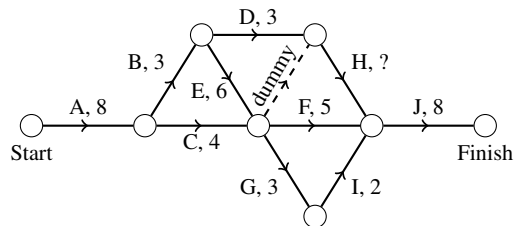
- a. 3
- b. Design

**Question 2**

- a.  $W, X$  and  $Y$
- bi.  $X$  and  $Z$
- bii. While there are only two trails that leave Cabin  $W$ , there are six different routes that can be taken directly to other cabins.

**Question 3**

- a. 20 minutes
- b. 18 minutes
- c. 9 minutes
- d.  $A-B-D-H-J$
- e. No change on minimum preparation time
- fi.



- fi. Attaching promotional material increases the minimum preparation time by 3 minutes to 34 minutes.

## Section B - Module 3 - Geometry and measurement

### Question 1

- a. Check with your teacher.  
b.  $\theta = 18^\circ$

### Question 2

- a.  $d = 70$  cm  
b.  $V = 199,920$  cm<sup>3</sup>  
c.  $r = 25.4$  cm

### Question 3

- a.  $148^\circ$   
b.  $\theta = 90^\circ$   
c. 184 m  
d.  $291^\circ$

## Section B - Module 4 - Graphs and relations

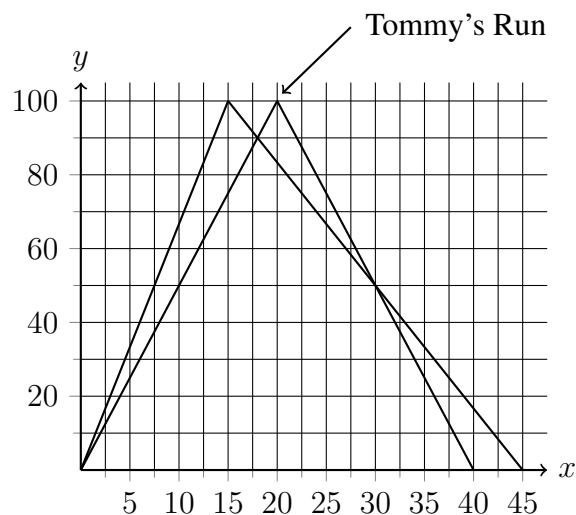
### Question 1

- a. 50 members  
b. 6 days

### FM394

- a. 125 m  
b. Check with your teacher.

c.



d. 30 seconds

### Question 3

- a. The number of chicken treats made each week must be no more than three times the number of beef treats made that week.  
b.  $x + y \leq 100$   
c.  $P = \$430$   
d.  $i = 4.47$        $j = 4.47$