

2024 VCAA General Mathematics Exam 1 Solutions

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Data analysis

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

Recursion and financial modelling

17	18	19	20	21	22	23	24
D	B	C	B	D	C	A	A

Matrices

25	26	27	28	29	30	31	32
B	B	B	C	C	B	D	D

Networks and decision mathematics

33	34	35	36	37	38	39	40
C	C	B	D	D	A	D	B

Data analysis

Q4 $10^{3.2} < \text{outlier} < 10^{3.4}$

Q5 Median = $\frac{1+2}{2} = 1.5$

Q6 $IQR = 48 - 5 = 43$, lower fence = $5 - 1.5 \times 43 = -59.5$, upper fence = $48 + 1.5 \times 43 = 112.5$

Q7 $z = \frac{x - \bar{x}}{s_x}$, $s_x = \frac{x - \bar{x}}{z} = \frac{48 - 55.7}{-1.75} \approx 4.4$

Q8 Gradient = $\frac{14 - 3}{19 - 7} = \frac{11}{12} \approx 0.917$

Q9 $b = r \frac{s_y}{s_x} \therefore r = \frac{bs_x}{s_y} = \frac{-1.27 \times 8.51}{19.0} \approx -0.569$

Q10 $25.6 = 67.5 - 1.27 \times \text{number}$, $\text{number} \approx 33$

Q14 $\frac{x+127}{13} = 11 \therefore x = 16$

Q15 $\frac{318+324}{2} = 321$

Q16 $x + \frac{x}{2} = 12 - (1.08 + 1.13 + \dots + 1.01 + 0.98) \therefore x \approx 1.38$

Recursion and financial modelling

Q18 $0.00075 \times 52 = 0.039 = 3.9\%$

Q20 $4.4\% \text{ pa} = 1.1\% \text{ per quarter} = 0.011$

$2000 \times 1.011^{12} - 2000 = 2000 \times r \times 3 \therefore r \approx 0.0468 = 4.68\%$

Q21 Interest = $2228.40 \times 12 \times 5 - 121000 = 12704$

Q22 $r = \frac{960}{240000} = 0.004 = 0.4\% \text{ per month}$

Interest = $238218 \times 0.004 \approx 952.8758$

Principal reduction = $2741.05 - 952.8758 \approx 1788.17$

Q23 108 months or 9 years

Q24 After two years, amount ≈ 21340.185

Matrices

Q27 $4h - 8g = 0$, $g = \frac{h}{2}$

Q31 Player J will never be ranked fifth regardless of the outcomes of the remaining two games.

Q32 Use $S_n = T^{-1}(S_{n+1} - A)$ repeatedly to get $S_0 = \begin{bmatrix} 4924 \\ 4732 \\ 6540 \\ 4904 \end{bmatrix}$

\therefore increase by $5620 - 4924 = 696$

Networks and decision mathematics

Q39 Initial allocation of tasks:

Carly Task 1, Blake Task 2, Dexter Task 3, Anush Task 4

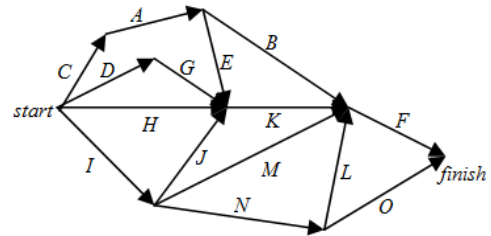
Minimum time = $11 + 7 + 16 + 9 = 43$

Final allocation:

Dexter Task 1, Edgar Task 2, Blake Task 3, Anush Task 4

Minimum time = $10 + 5 + 15 + 9 = 39 \therefore$ reduced by 4 hours.

Q40



Please inform mathline@itute.com re conceptual and/or mathematical errors

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