


Test 2 – Other Financial Considerations & Matrices Solutions

Thursday, May 19, 2022 6:15 AM

2022 Yr 11 Apps Test...

NAME:



Resource Free: /16

Resource Rich: /39

Total: /55

%

2022 Test 2 Other Financial Considerations & Matrices

Section 1: Resource Free  
Time: 15 minutes

TIME ALLOCATION FOR THIS TEST  
Section 1 – Resource Free  
15 minutes working time  
After exactly 15 minutes have elapsed Section 1 will be collected, and Section 2 will begin.  
Section 2 – Resource Rich  
40 minutes working time  
Material requiredrecommended for this test  
To be provided by the supervisor  
Question/answer booklet for Section One and Two, and formula sheet.  
To be provided by the candidate  
Section One:  
Standard items: pens, pencils, pencil sharpener, highlighter, eraser, ruler  
Special materials: drawing instruments, templates.  
Section Two:  
Standard items: pens, pencils, pencil sharpener, highlighter, eraser, ruler  
Special materials: drawing instruments, templates, notes on a maximum of one single sided unfolded sheet of A4 paper, up to three calculators (CAS, graphics or scientific)

**Important note to candidates**  
No other items may be taken into the test room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the test room. If you have any unauthorised material with you, hand it to the teacher **before** reading any further.

Although marks are not necessarily awarded for working, it is recommended that **enough working to justify** your responses is shown. Incorrect answers with no working will be awarded **zero** marks.

Q1. [7 marks: 1,3,3]

$$A = \begin{bmatrix} 1 & 9 \\ 6 & 5 \\ 2 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 9 & -6 \\ 1 & 4 \end{bmatrix} \quad C = \begin{bmatrix} -8 & 3 \\ 0 & 1 \end{bmatrix} \quad D = \begin{bmatrix} 3 & -3 & 7 \\ 6 & 8 & -5 \end{bmatrix}$$

Determine each of the following

- a)  $B - C$
- b)  $DA$
- c) Determine the values of the constants  $a, b, c$  given that  $5I + a \begin{bmatrix} -2 & 9 \\ 1 & b \end{bmatrix} = \begin{bmatrix} c & 27 \\ 3 & 32 \end{bmatrix}$

Q2. [6 marks: 1,2,3]

A system of one-way and two-way paths connects three locations A, B, and C. There may be more than one path between any two locations. The table below show the number of ways to travel between these locations using a single path.

		To		
		A	B	C
From	A	0	1	1
	B	0	0	2
	C	2	2	0

- a) Is the path between A and B one-way or two-way? Justify your answer.

- b) Complete the network below to show the information in the table.

- c) Calculate and list the number of ways to travel from B to A using 2 paths.

Q3. [3 marks: 1,2]

Ana is traveling to Brazil for a holiday.

- a) On the day she leaves, 1 Brazilian Real equals 0.36 Australian Dollars. If she exchanges \$1000 Australian dollars, how much does she receive in Real? Give your answer to the nearest Real.
- b) On the day she returns, 1 Brazilian Real equals 0.39 Australian Dollar. If she has 1000 Brazilian Real left, how many Australian dollars has she spent while on holiday?

End of Section 1

NAME:

Section 2: Resource Rich  
Time: 40 minutes

Q4. [3 marks]

The pay rates for full and part time 17-year old employees are shown in this table:

Base Pay Rate	Monday to Friday 7p.m. - midnight	Monday to Friday Midnight - 7a.m.	Saturday	Sunday
\$10.93/hr	\$10.93/hr + \$2.06/hr or part of an hour	\$10.93/hr + \$3.09/hr or part of an hour	\$13.66/hr	\$19.13/hr

Meals and other breaks are unpaid.

A 17-year old was asked to cover for an absent staff member from 3 pm to 11 pm one Thursday, taking a meal break from 7.15 pm to 8 pm. How much did they earn this day?

Q5. [4 marks]

A supermarket has three options for purchasing a brand of cereal:

Standard \$2.49 for 220g  
Economy \$5.00 for 725g  
Supersize \$11.50 for 2kg

Retail laws require the supermarket to display the price per 100g for each size cereal, to the nearest cent.

Calculate the cost of each for 100g and order the cereals in order of value, best value first.

Q6. [7 marks: 3,4]

The JobSeeker Payment is a government payment to help individuals aged 22 years or more who are looking for work. The maximum fortnightly payment for a single person with no children is \$642.70.

JobSeeker recipients can earn up to \$150 per fortnight (before tax) before their payment is affected. Income over \$150 and up to \$256 per fortnight reduces the fortnightly payment by 50 cents in the dollar and income above \$256 per fortnight reduces the payment by 60 cents in the dollar.

Determine the fortnightly allowance paid to the following:

- a) A person who earns \$120 per week.
- b) A person who works part-time in a job paying \$22.75/hr for 12 hours each week.

Q7. [6 marks: 2,2,2]

Ava's spending is becoming a bit worrying, and she decides to make a list of her regular expenses in order to manage her finances better.

- a) Calculate how much she spent on her bills last year.

Mortgage	\$1600/month
Electricity	\$250 every 2 months
Gym fees	\$175/month
Home insurance	\$935/year
Gas	\$140 every 2 months
Water	\$230 every 3 months
Vehicle registration	\$650/year
Council rates	\$1750/year
Telephone/Internet	\$20/week

- b) How much should Ava allocate each week in order to cover her expenses? Round your answer to the nearest \$10.

- c) What percentage of her expenses are for ~~discretionary~~ <sup>Fixed</sup> spending?

Q8. [10 marks: 4,4,2]

An investor is considering purchasing stock in the gas and oil industry. His research reveals the following information about two such companies.

WA Offshore: Market price of \$15.50 a share; dividend of 30 cents per share which represented 25% of after tax earnings.  
Shalegas: Market price of \$8.96; total share issue of 5.4 million, annual after tax earnings of \$6.048 million.

- a) Calculate the earnings per share for both companies.
- b) Determine the price to earnings ratio for both companies.

- c) How can the P/E ratios be used by an investor to compare these companies?

Q9. [9 marks: 1,1,2,2,3]

The number of hours of labour required by each worker A, B and C during the manufacture of three products P, Q, and R is shown in the Matrix M below:

	P	Q	R
A	3	2	2
B	0	4	3
C	4	1	2

- a) Explain the significance of the  $m_{21}$  in matrix M.
- b) Due to differing experience, workers A, B and C are paid \$16, \$20 and \$22 per hour respectively. Express this information in the row matrix N that is consistent with the information in matrix M.

- c) Determine the product of matrices M and N, in whatever order is possible, and explain what the resulting matrix S shows.

- d) A standard production run consists of the manufacture of 3, 1 and 2 product P, Q and R respectively. Write down a suitable matrix T so that the product ST will show the total labour cost for a standard production run and determine this total labour cost.

- e) During a standard production run, worker B is not available to maintain production, worker A takes on an extra four hours for product Q and worker C takes on an extra three hours for product R. Determine, with justification, the effect this has on the total labour cost for a standard production run.

End of Test