EQUITY
LEARNING PLACE

1) Mrs Lim either cooks dinner at home or eats out each evening. The probability that she cooks dinner at home is 0.4. When she eats out, she either eats at the food court or the hawker centre. The probability that she eats at the hawker centre is 0.7. Find the probability that, on a particular evening, Mrs Lim eats at the food court.

Answer: _____ [2]

2) Box A contains 5 red cards, 3 blue cards and 2 green cards.

Box B contains 4 red cards and 5 blue cards.

A card is drawn at random from Box A and put into Box B. Next a card is then drawn at random from Box B.

a) Draw a tree diagram to show the probabilities of the possible outcomes. [2]

Find the probability that,

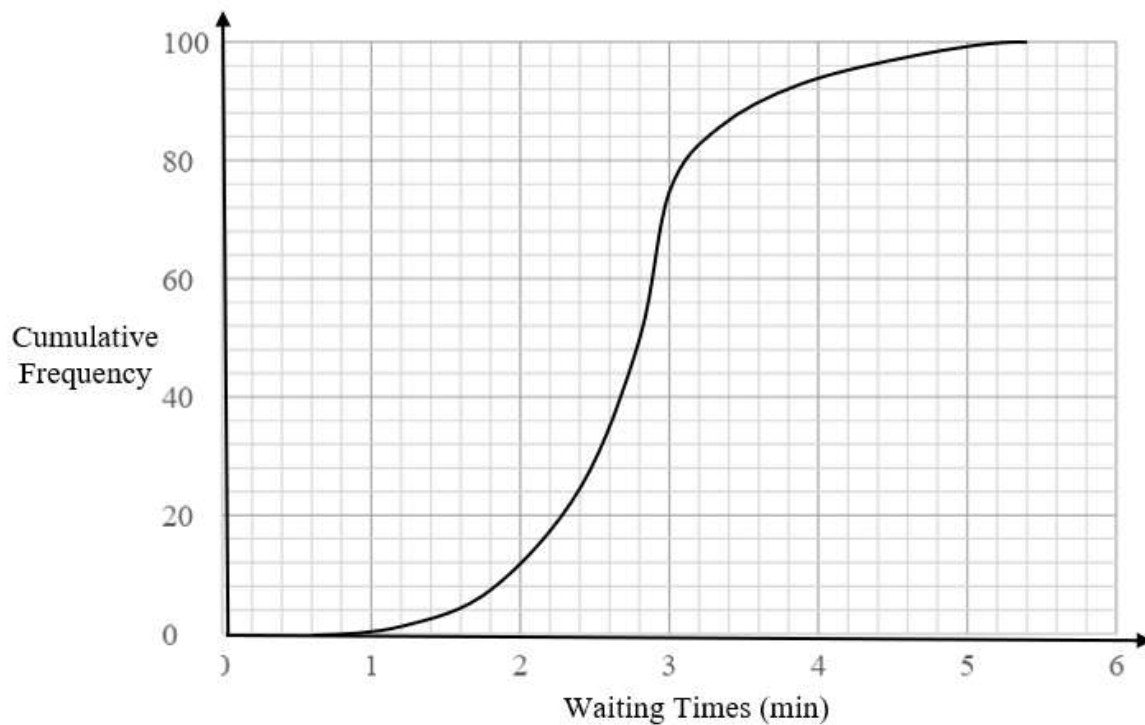b) two blue cards are drawn,

Answer: _____ [1]

c) at most 1 of the card is blue,

Answer: _____ [1]

d) the two cards are of different colours

Answer: _____ [2]

3) The waiting times for 100 customers queuing for service in McDonald's were recorded on a Monday morning. The cumulative frequency curve below shows the distribution of the waiting times.

Use the curve to estimate,

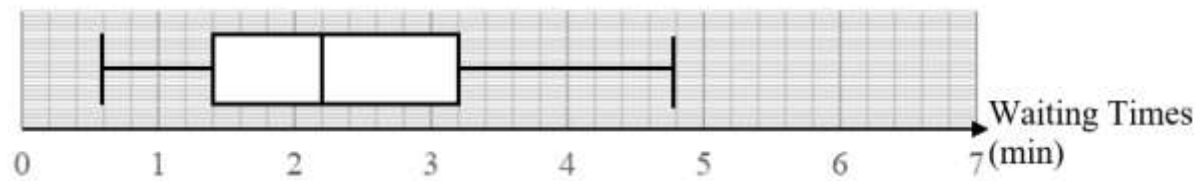a) the median waiting time,

Answer: _____ [1]

b) the interquartile range,

Answer: _____ [1]

c) Estimate the percentage of customers whom waiting time is more than 4 minutes.

Answer: _____ [1]

The waiting times for 60 customers in KFC were also recorded over the same duration. The distribution of the waiting times is represented in the box-and-whisker diagram below.

d) Two KFC customers are selected at random.

Find the probability that one customer waited more than 2.2 minutes while the other customer waited less than 1.4 minutes.

Answer: _____ [2]

e) Make two comments comparing the waiting times for McDonald's and KFC. Justify your comments.

Answer:

_____

_____

_____

_____ [2]

4) The following table shows the number of pens, pencils and files bought by Peter and Mary at a stationery shop in May.

	Pens	Pencils	Files
Peter	5	3	10
Mary	8	7	4

The cost of a pen, pencil and a file are $2.50, $5 and $3 respectively.

a) Represent the information in the table by a 2 x 3 matrix **N**.

Answer: _____ [1]

b) Represent the costs using a 3 x 1 matrix **C**

Answer: _____ [1]

c) Evaluate the matrix $\mathbf{T} = \mathbf{NC}$

Answer: _____ [1]

d) State what each of the elements in **T** represents.

_____

_____ [1]

e) The stationery shop decided to give a discount for pens but increased the price of pencils in June. The cost of a pen was reduced by 20% while the cost of a pencil was increased by 30%. The cost of the price of a file remained the same. Write down a 3 x 1 matrix **S,** which gives the sale price of the stationery in June.

Answer: _____ [2]

f) Using matrix multiplication, calculate the amount of money that Mary and Peter each paid in June for the same number of stationery items bought in May.

Answer: _____ [2]

5) Given that $\mathbf{A} = \begin{pmatrix} -1 & 4 \\ 2 & -3 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 0 & -2 \\ 1 & -1 \\ 2 & 0 \end{pmatrix}$, find

a) $\mathbf{A}^2$

Answer: _____ [2]

b) the matrix multiplication of $\mathbf{A}$ and $\mathbf{B}$ such that it exists.

Answer: _____ [2]

6) $\mathbf{A} = \begin{pmatrix} 3 & -1 \\ -4 & 2 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} x \\ 10 \end{pmatrix}, \mathbf{D} = \begin{pmatrix} y \\ 32 \end{pmatrix}$

Given that $\mathbf{AC} = \mathbf{D}$, find the value of x and y.

Answer: _____ [3]

End of paper