TANJONG KATONG GIRLS' SCHOOL
WEIGHTED ASSESSMENT TWO
SECONDARY FOUR

CANDIDATE NAME					
CLASS				INDEX NUMBER	

MATHEMATICS 4052

Term 2 Week 5 2026

Candidates answer on the Question Paper. **40 minutes**

READ THESE INSTRUCTIONS FIRST

Write your index number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.

Answer **all** questions.
If working is needed for any question it must be shown with the answer.
Omission of essential working will result in loss of marks.
The use of an approved scientific calculator is expected, where appropriate.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142, unless the question requires the answer in terms of π.

The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 30.

For Examiner's use

Mathematical Formulae

Compound interest

$$\text{Total amount} = P\left(1+\frac{r}{100}\right)^n$$

Mensuration

$$\text{Curved surface area of a cone} = \pi rl$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a cone} = \frac{1}{3}\pi r^2 h$$

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Area of triangle } ABC = \frac{1}{2}ab\sin C$$

$$\text{Arc length} = r\theta, \text{ where } \theta \text{ is in radians}$$

$$\text{Sector area} = \frac{1}{2}r^2\theta, \text{ where } \theta \text{ is in radians}$$

Trigonometry

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc\cos A$$

Statistics

$$\text{Mean} = \frac{\Sigma fx}{\Sigma f}$$

$$\text{Standard deviation} = \sqrt{\frac{\Sigma fx^2}{\Sigma f} - \left(\frac{\Sigma fx}{\Sigma f}\right)^2}$$

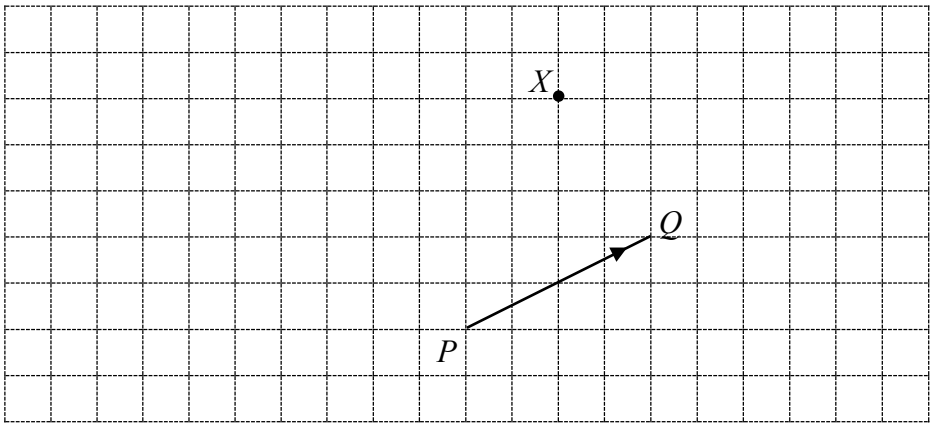
1 **(a)** Show that $3\sqrt[4]{x^{-4}y^{-8}}^{\,3} = 3x^{-3}y^{-6}$. [1]

(b) Hence, simplify $3\sqrt[4]{x^{-4}y^{-8}}^{\,3} \times \left(\frac{81x^6}{y^8}\right)^{\frac{1}{2}}$ and leave your answer in positive index form.

Answer ..... [2]

2 Mandy deposited \$150 000 in a 5-year investment plan. For the first two years, it offers a simple interest rate of 4% per annum. After two years, the accumulated sum will enjoy a compound interest of 5% per annum, compounded quarterly for 3 years.
Show that the amount of interest she will receive at the end of 5 years is about \$38 000 (rounded to the nearest thousand). [4]

3 The diagram shows the positions of the points X, P and Q where $\overrightarrow{PQ} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ is represented in the grid below.



(a) Y is the point such that $PQXY$ is a parallelogram.

(i) **Mark and label** the point Y on the grid above. [1]

(ii) Express $\overrightarrow{PY}$ as a column vector.

Answer $\overrightarrow{PY} =$…… [1]

(b) Find $\left|\overrightarrow{QX}\right|$. Leave your answer in 2 significant figures.

Answer $\left|\overrightarrow{QX}\right|$=……..… units [1]

4 (a) Two fair dice with sides numbered 1 to 6 are thrown at the same time. Find the probability that both dice show the same number.

Answer …… [1]

4 (b) The table below shows the results of a survey in which 60 students were asked whether they played video games every day during the school holidays and whether they had trouble sleeping at night.

	Played video games	
	Daily	Not daily
Trouble sleeping	46	2
No trouble sleeping	8	4

Two students were selected at random from the whole group of students.
Find the probability that

(i) at least one student had trouble sleeping at night.

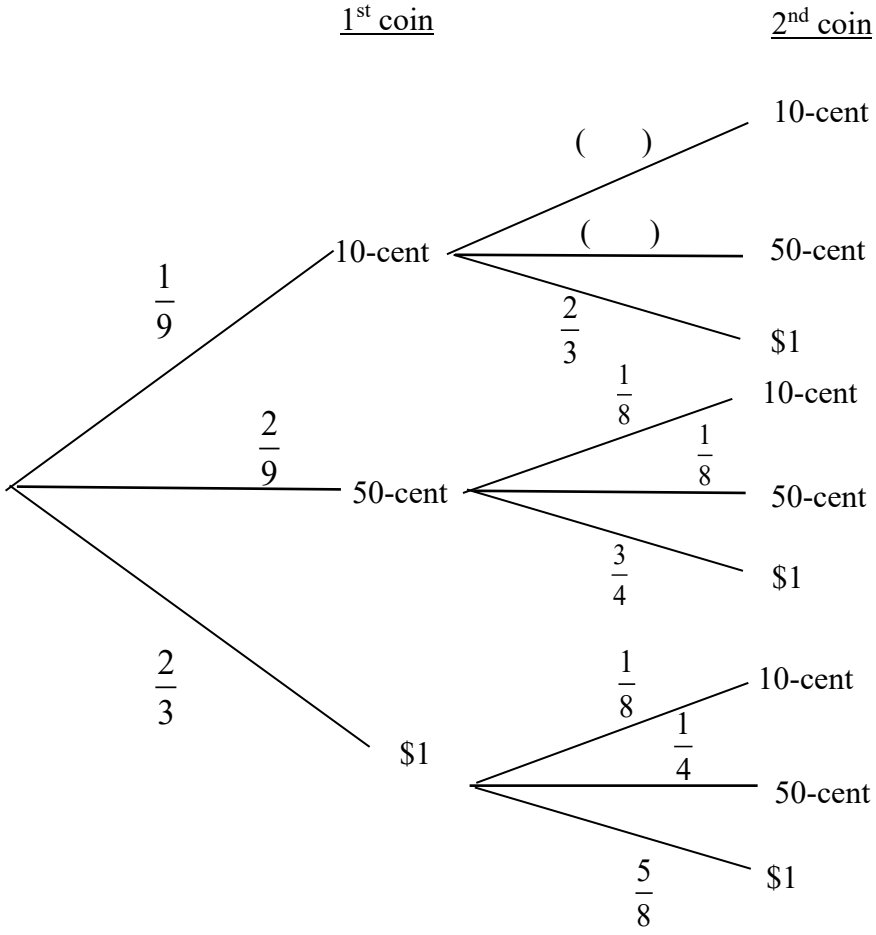
Answer …… [2]

(ii) neither of them played video games daily nor had trouble sleeping.

Answer …… [1]

5 A little girl has 9 coins in her pocket. She has one 10-cent coin, two 50-cent coins and six \$1 coins.
To pay for a drink which costs \$1.50, she randomly takes out a coin from her pocket.
If the coin is a 10-cent coin, it is put back into the pocket.
Then, she takes out the next coin.

(a) Complete the Tree Diagram. [1]



(b) Given that the first coin is a 50-cent coin, find the probability that the second coin is a \$1-coin.

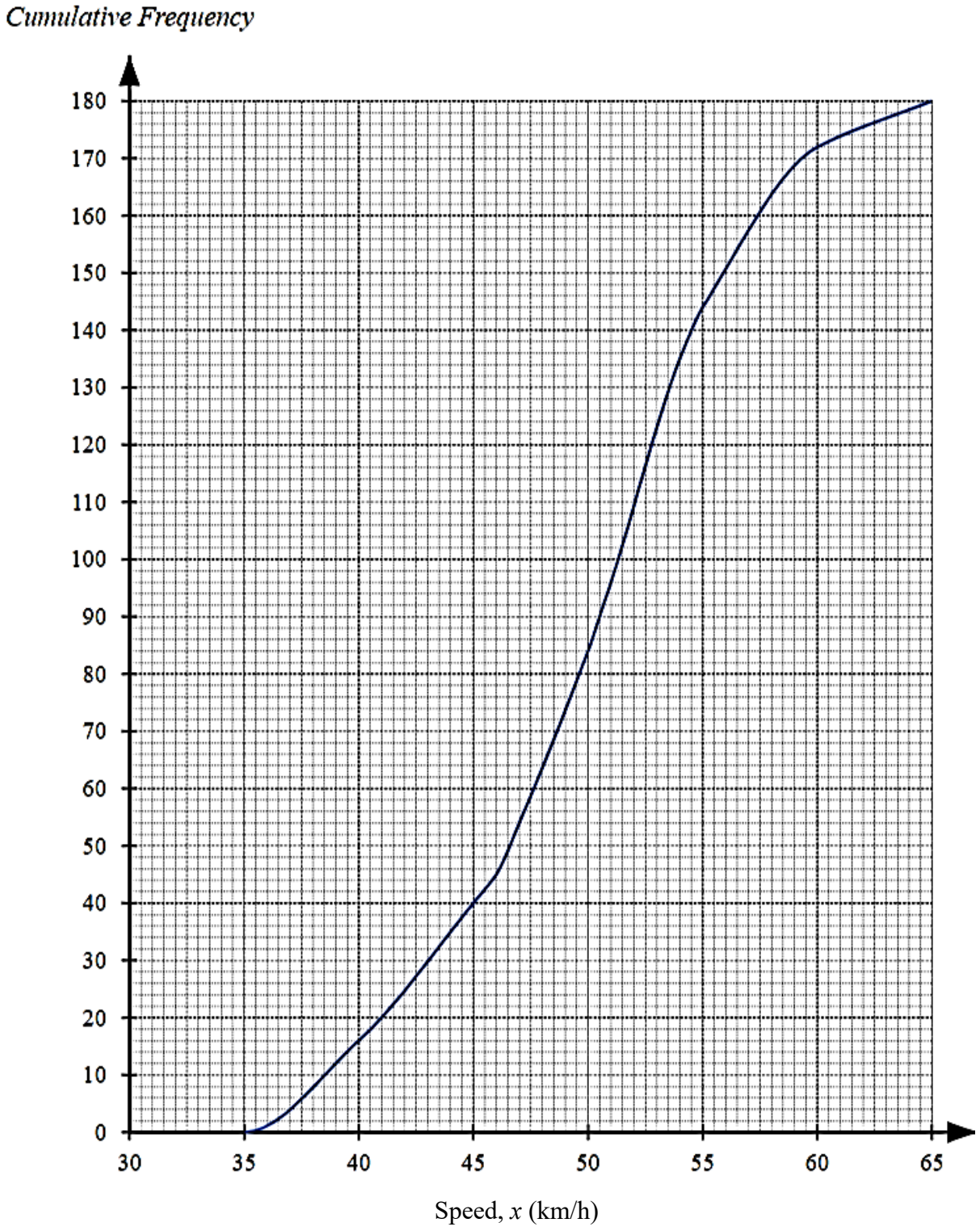
Answer …… [1]

(c) Find the probability that she will have enough to pay for her drink after randomly taking out a coin twice.

Answer …… [2]

6 On a **weekday**, 180 cars travelled passed a certain point on a street. The speed of each car was recorded.

The cumulative frequency curve below shows the speed, x km/h, and the number of cars whose speed is less than or equal to x km/h.



(a) Given the following frequency table, calculate an estimate of the mean and standard deviation.

Speed (x km/h)	$35 < x \leq 40$	$40 < x \leq 45$	$45 < x \leq 50$	$50 < x \leq 55$	$55 < x \leq 60$	$60 < x \leq 65$
Frequency	16	24	44	60	28	8

Answer Mean=……km/h [1]

Standard deviation
= ……..…km/h [1]

(b) Use the curve to estimate

(i) the median speed,

Answer ……km/h [1]

(ii) the interquartile range.

Answer ……km/h [1]

(c) The k^{th} percentile speed is 47 km/h. Write down the value of k.

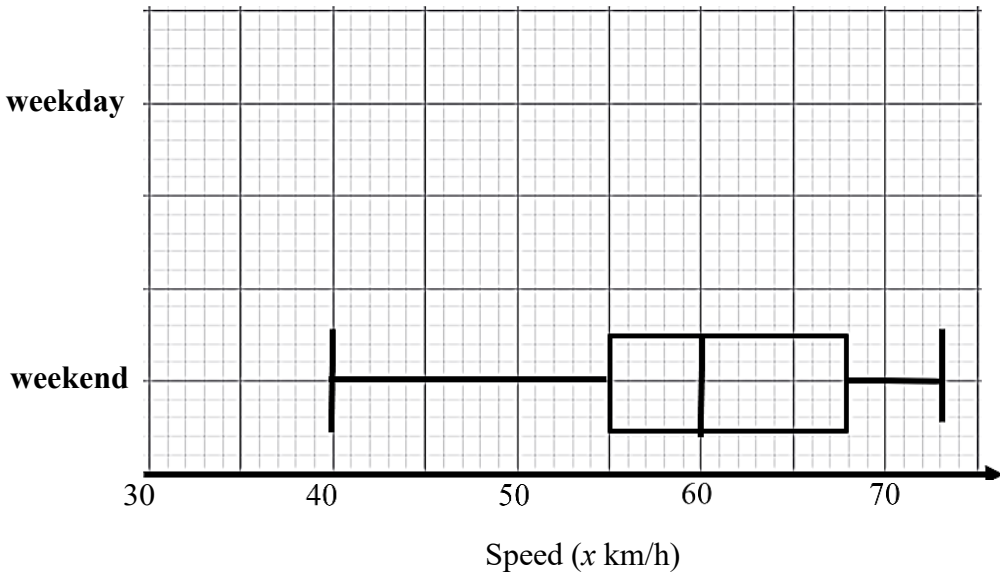
Answer k = …… [1]

(d) A car is picked at random from the 180 cars. The probability that the car travels more than y km/h is $\frac{7}{15}$. Find y.

Answer y = …… [2]

(c) On a **weekend**, another 180 cars travelled passed the same point on the street. The speed of each car was recorded.
The box-and-whisker plot below shows the speed of the cars on the **weekend**.

(i) Draw the box-and-whisker plot on the same grid below to illustrate the speeds of 180 cars on the **weekday**. [2]



(ii) Make one comment comparing the speeds of the cars on the weekday and the weekend.

Answer

…….

…….

…….[1]

(iii) If the speed of one car was incorrectly recorded and its speed was updated to 90 km/h in the dataset collected on the **weekday**, which of the value(s) in the five-number summary of the box-and-whisker plot will change? Based on the change(s), describe briefly what will happen to the lengths of the whiskers and the length of the box.

Answer

…….

…….[1]

(iv) Sally says, "On the **weekend**, the number of cars travelling at up to 55 km/h is greater than the number travelling between 55 and 68 km/h."
Is she correct? Give a reason for your answer.

Answer

…….

…….

…….

…….

……. [1]

End of Paper