

SECTION I

ANSWER ALL QUESTIONS IN THIS SECTION

Write your answers in the spaces provided and show ALL working.

1. (a) Calculate the exact value of

$$\left[\frac{4}{7} - \frac{1}{3} \right] \times \frac{7}{10}$$

[3 marks]

$$= \frac{12-7}{21} \times \frac{7}{10}$$

$$= \frac{5}{3} \times \frac{1}{2} = \frac{1}{6}$$

(b) Express 2.125 as an improper fraction.

$$\begin{aligned} 2.125 &= 2 \frac{1}{8} \\ &= \frac{17}{8} \end{aligned}$$

[2 marks]

(c) Express 5 678 in standard form.

$$5678 = 5.678 \times 10^3$$

[1 mark]

[TOTAL 6 marks]

2. (a) A piece of ribbon is cut into two pieces in the ratio 3:7. The length of the shorter piece is 45 cm. Calculate the length, in cm, of the longer piece of ribbon.

$$\text{Total parts} = 7 + 3 = 10$$

[2 marks]

$$3 = 45$$

$$\Rightarrow 1 = 15$$

$$\Rightarrow 7 = 105 \text{ cm.}$$

- (b) (i) Convert Bds \$140.00 into US \$ using the following exchange rate:

EXCHANGE RATE

[2 marks]

Bds \$2.00 = US \$1.00

$$\text{Bds } \$2.00 = \text{US } \$1.00$$

$$\Rightarrow \text{Bds } \$1.00 = \text{US } \$0.50$$

$$\Rightarrow \text{Bds } \$140 = \text{US } \$70.00$$

- (ii) Bob converted Bds \$140.00 into US \$. If a 2% tax was charged on the transaction, how much money, in US dollars, did he get after paying the tax?

[2 marks]

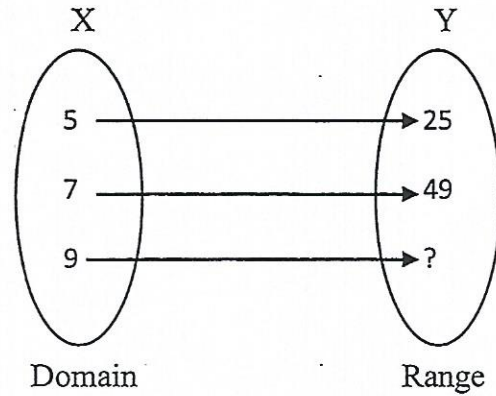
$$\frac{2}{100} \times 70 = \$1.40$$

$$70 - 1.40$$

$$= \$68.60$$

[TOTAL: 6 marks]

3. (a) The arrow diagram shown below represents a mapping between the members of set X and the members of set Y.



- (i) State an equation which represents the relationship between x and y .

$$y = x^2$$

[1 mark]

- (ii) State the image of 9.

$$y = (9)^2 = 81$$

[2 marks]

- (iii) Is this relation a one-to-one, a many-to-one or one to many?

One-to-one.

[1 mark]

- (b) Lucas ran a 400 m race in 50.0 seconds.

Calculate his speed in metres per second.

$$\text{Speed} = \frac{\text{Dist.}}{\text{time}}$$

$$= \frac{400}{50}$$

$$= 8 \text{ ms}^{-1}$$

[2 marks]

[TOTAL 6 marks]

4. Ideal Bank pays 8% Simple Interest per annum on savings.

Mr. Brown deposited \$12 000.00 at Ideal Bank.

(a) How much time will it take Mr. Brown to earn Simple Interest of \$2 400.00 on his deposit?

$$T = \frac{I \times 100}{P \times R} = \frac{\cancel{2400} \times 100}{\cancel{12000} \times 8} = 2\frac{1}{2} \quad [4 \text{ marks}]$$

$$T = 2\frac{1}{2} \text{ years.}$$

(b) Calculate the amount Mr. Brown would earn after 5 years.

$$\begin{aligned} S.I &= \frac{P \times R \times T}{100} && [2 \text{ marks}] \\ &= \frac{12000 \times 8 \times 5}{100} \\ &= 4800 \end{aligned}$$

$$\begin{aligned} A &= S.I. + P \\ &= 4800 + 12000 \\ &= 16800 \end{aligned}$$

[TOTAL 6 marks]

5. A pack of 8 exercise books cost \$x.

A pen costs \$12.00 more than a pack of exercise books.

(a) Write, in terms of x, the cost of 1 pen.

[1 mark]

$$P = x + 12.$$

(b) The total cost of 1 pack of exercise books and 1 pen is \$76.00.

Express this information as an equation in x.

[2 marks]

$$x + P = 76$$

$$x + x + 12 = 76$$

$$2x = 64$$

$$x = \$ 32$$

(c) Solve the equation in Part (b) above to determine, in dollars, the cost of 1 exercise book.

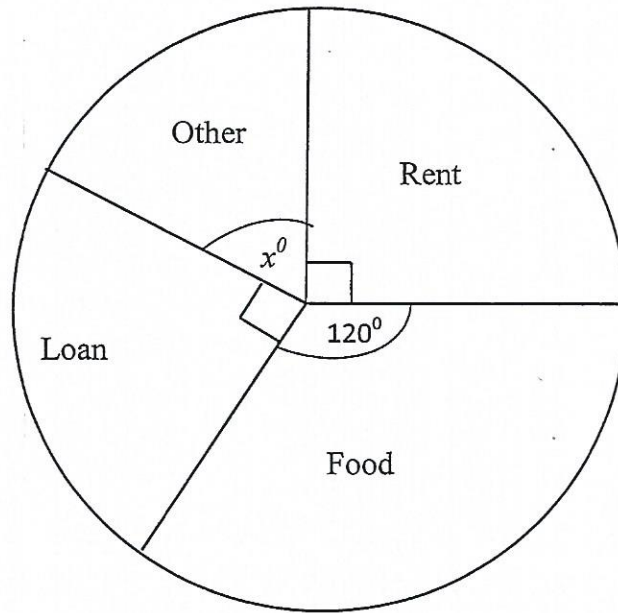
$$8 \text{ Ex. books cost } \$ 32$$

[3 marks]

$$\Rightarrow 1 \text{ book costs } \frac{32}{8} = \$ 4.00$$

[TOTAL 6 marks]

6. (a) The Pie Chart shows how Ms. Chen spends her monthly income of \$6 000.00.



(i) How much, in dollars, is Ms. Chen's loan payment?

[2 marks]

$$\frac{90}{360} \times \frac{100}{100} = \$1500$$

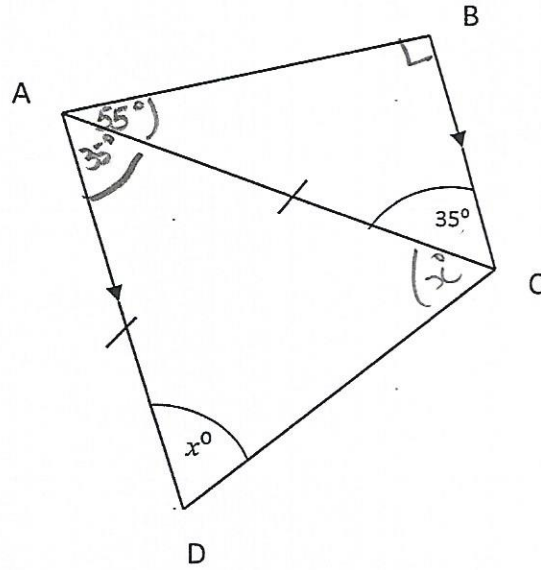
(ii) Calculate the value of x.

[2 marks]

$$\begin{aligned} x &= 360 - 180 - 120 \\ x &= 360 - 300 \\ x &= 60^\circ \end{aligned}$$

* (b) ABCD is a trapezium with parallel sides AD and BC.

Angle ACB = 35°. The length of the sides AC and AD are equal.



$$\begin{array}{r} 180 \\ - 125 \\ \hline 55 \end{array}$$

$$\begin{array}{r} 110 \\ - 70 \\ \hline \end{array}$$

Calculate the value of x.

$$180 - 35 = \frac{145}{2}$$

$$= 72.5^\circ$$

[3 marks]

[TOTAL 7 marks]

SECTION II

ANSWER ANY TWO (2) QUESTIONS IN THIS SECTION
(Show ALL working)

7 (a) Jamal can purchase a flat screen television in two ways.

HIRE PURCHASE

Down Payment \$480.00 Monthly installment of \$320.00 for $2\frac{1}{2}$ years.

CASH PURCHASE

Cash Price \$9800.00 + 10% Discount on Cash Price

(i) Calculate the total cost of the flat screen television under Hire Purchase.

$$\begin{aligned} & (30 \times 320) + 480 \\ & = 9600 + 480 \\ & = \$10080 \end{aligned}$$

[2 marks]

(ii) How much does Jamal pay for the flat screen television, if he chooses the Cash Purchase?

$$\frac{10}{100} \times 9800 = 980$$

$$\begin{array}{r} 9800 \\ 980 \\ \hline 8820 \end{array}$$

[2 marks]

Ans: \$8820.

(iii) How much would Jamal save if he chooses the Cash Purchase over the Hire Purchase of the flat screen television?

$$\begin{array}{r} \$ 10080 \\ - \$ 8820 \\ \hline \underline{\underline{\$ 1260 \text{ saved}}} \end{array}$$

[2 marks]

(b) A clothes vendor bought a number of T-shirts costing \$15.00 each, paying a total of \$2625.00.

(i) Calculate the number of T-shirts bought.

$$\frac{2625}{15} = 175 \text{ shirts.}$$

[2 marks]

(ii) If each T-shirt is sold for \$22.00, calculate the total profit made after selling all the T-shirts.

$$\begin{aligned} \text{Profit} &= 175 \times 7 \\ &= \$1225. \end{aligned}$$

[4 marks]

TOTAL: [12 marks]

8. The equation $y = 3x - 4$ represents the relationship between two variables x and y .

(a) (i) Use the given equation $y = 3x - 4$ to complete the table below.

x	2	4	6	8
y	2	8	14	20

[3 marks]

(ii) Using the grid given on page 12 and a suitable scale on the y -axis, plot the points from your table above and draw the graph of $y = 3x - 4$.

[4 marks]

See Graph Sheet.

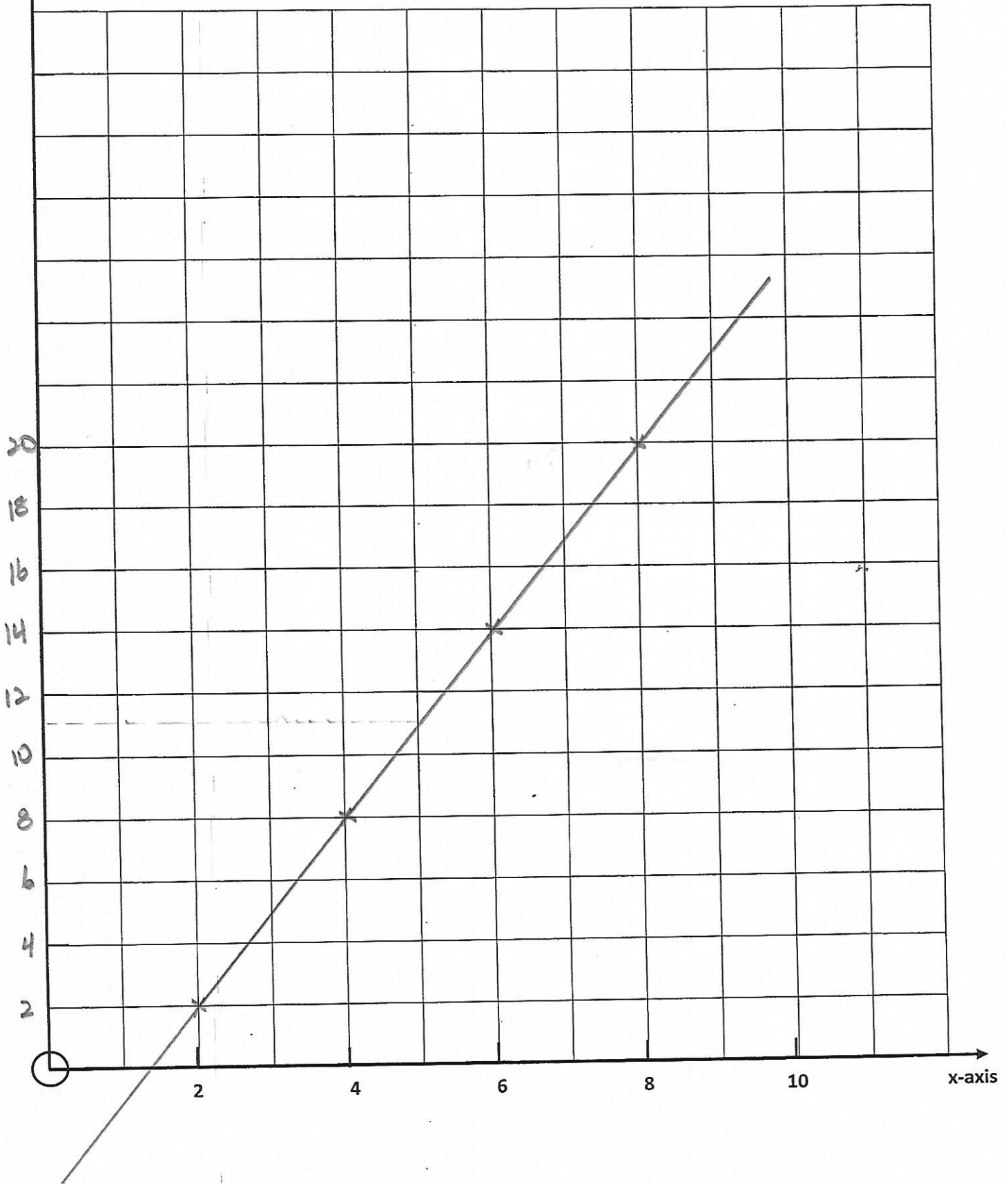
(iii) From the graph, determine the value of y at $x = 5$.

[1 mark]

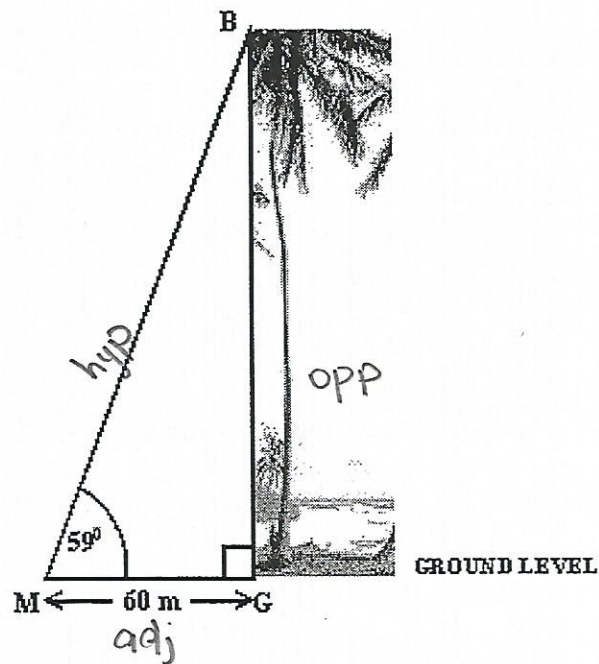
$$y = 11$$

y-axis

Answer Sheet for Question 8 (a)



- (b) In the diagram below (not drawn to scale), the height of the coconut tree is represented by the side BG of triangle BGM.



Matthew stands at a point M, which is 60 metres from G, the base of the coconut tree. He sees a bird at the top of the tree at an angle of elevation 59° as shown in the diagram above.

Calculate the height of the tree in metres.

[4 marks]

$$\tan 59 = \frac{\text{opp}}{\text{adj}} = \frac{\text{opp}}{\text{adj} \cdot 60}$$

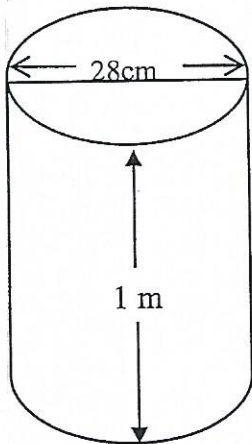
$$\text{opp} = 60 \times \tan 59$$

$$= 99.8 \text{ m}$$

$$\approx 100 \text{ m}$$

[Total 12 marks]

9. (a) A cylindrical barrel of height 1 m and diameter 28 cm is shown in the following diagram.



Take $\pi = \frac{22}{7}$.

- (i) Calculate the volume, in cm^3 , of the cylindrical barrel.

[3 marks]

$$\begin{aligned} V &= \pi r^2 h \\ &= \frac{22}{7} \times 14 \times 14 \times 100 \\ &= 4400 \times 14 \\ &= 61600 \text{ cm}^3 \end{aligned}$$

- (ii) How many containers each holding $12\,320 \text{ cm}^3$ of water will be required to fill the barrel.

$$\frac{61600}{12320} = 5 \text{ containers} \quad [2 \text{ marks}]$$

(b) The table shows the results of a survey on the type of snacks preferred by students in a Form 3 class.

Type of snacks	Chocolate	Peanuts	Donuts	Biscuits	Fruits
Number of students	8	6	9	2	5

(i) What was the favourite snack of the students in the survey?

Donuts.

[1 mark]

(ii) How many more students preferred chocolate than fruits?

$$8 - 5 = 3 \text{ students.}$$

[2 marks]

(iii) Calculate the total number of students in the survey.

$$8 + 6 + 9 + 2 + 5 = 30 \text{ students.}$$

[1 mark]

(c) An ordinary fair die is thrown.

(i) List all the possible outcomes.

①, 2, ③, 4, ⑤, 6. — 6 outcomes.
3 odd numbers.

[1 mark]

(ii) What is the probability of obtaining an odd number?

$$\frac{3}{6} = \frac{1}{2}$$

[2 marks]

[TOTAL 12 marks]

END OF TEST