For Examiner's Use

Section 1 [40 marks]

Answer **all** the questions.

1 (a) Rearrange the following numbers, in descending order, on the number line provided.

$$\sqrt{9},\ \frac{7}{22},\ \pi,\ -3.142,\ 3.1\dot{8}.$$

(b) State the number(s) which are irrational.

(*a*) *Answer* ⟷ [1]

(*b*) …….. [1]

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2 (a) Write down the first 5 figures of $\dfrac{\sqrt[3]{-26.6}\times 19.9^2}{49.6-529}$.

(b) Use your calculator to evaluate the value of $\dfrac{\sqrt[3]{-26.6}\times 19.91^2}{49.63-529.01}$, giving your answer correct to

(i) 2 decimal places,

(ii) 1 significant figure.

Answer(*a*) ……..…….. [2]

(*b*)(i) …….. [1]

(ii) ……..……..…….. [1]

For Examiner's Use

3 **(a)** Express $100 \times 0.\dot{4}\dot{7}$ as a recurring decimal.

(b) Find the value of $100 \times 0.\dot{4}\dot{7} - 0.\dot{4}\dot{7}$.

(c) **Hence**, express $0.\dot{4}\dot{7}$ as a fraction in its lowest terms.

Answer (*a*) ……..…..…….. [1]

(*b*) ……..…….…….. [1]

(*c*) ……..…….…….. [1]

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4 Factorise completely

(a) $8x^2y - 20xy^3$,

(b) $2(m-5n) - m(m-5n)$.

Answer (*a*) ……..…..…….. [1]

(*b*) ……..…….…….. [1]

For Examiner's Use

5 In a particular shopping centre, the ground level is indicated by 0 and the basement levels are indicated by −1, −2 and so on. The shopping centre has 4 basement levels.

(a) Zhenqi parked her car at Level −2 and took the lift to the highest level. If the lift travelled up by 7 levels, find the highest level of the shopping centre.

(b) There are two lifts located at Lift Lobby A of the shopping centre. For every two levels that Lift 1 travels, Lift 2 travels three levels. If Lift 1 is now at the highest level and Lift 2 at the lowest level, find the level that Lift 2 is at when Lift 1 is at Level −1.

Answer (*a*) ……..…..…….. [1]

(*b*) ……...…….……... [2]

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6 **(a)** 0.068% of a number is 85. Find the number.

(b) String *P* is 3.8 m long. The length of String *Q* is 135% of the length of String *P* and 95% of the length of String *R*. Find the length of String *R*.

Answer (*a*) ……..…..…….. [1]

(*b*) ……...…….……....m [2]

For Examiner's Use

7 The journey of a motorist from Town *A* to Town *B* took him $2\frac{1}{4}$ hours.

(a) If the motorist travelled at an average speed of 10 m/s, calculate the distance between the two towns in kilometres.

(b) The motorist arrived at 12 10. Calculate the time he left Town *A*.

Answer (*a*) ……..…..……..….km [2]

(*b*) ……..…….……....h [1]

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8 Simplify

(a) $2xy - 3yz + 5xy + 2yz$,

(b) $\frac{2g+3h}{2} - \frac{6g-h}{4}$.

Answer (*a*) ……..…..……..…….. [1]

(*b*) ……..…….……..... [3]

For Examiner's Use

9 Jazzy has a job for which the basic rate of pay is \$$C$/hour and the overtime rate of pay is \$24/hour. On a particular day, she works for 12 hours, of which 4 hours are overtime.

(a) Express her pay in terms of C.

(b) Find the value of C if she is paid \$180 for that day.

(c) How many hours of overtime must she work in total in order to earn \$660 in a 5-day work week?

Answer (*a*) \$..... [1]

(*b*) \$..... [2]

(*c*) .....h [2]

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10 It is given that

$$v = u - \frac{2ab^2}{3}.$$

Find the value of v when $u = 30$, $a = 3$ and $b = -2$.

Answer $v =$ .....[2]

For Examiner's Use

11 (a) The mass of Xueling, measured to the nearest kg, is 43kg. Find the smallest possible value of Xueling's mass.

(b) In the number 608*R*32, *R* represents a digit. Given that 608*R*32, correct to three significant figures is 608 000, state the smallest value of the digit *R*, where *R* is a prime number.

Answer (*a*) ....……..…..…….....….kg [1]

(*b*) ....……..……..... [1]

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12 Eunice, Megan and Shannon planned to contribute money in the ratio 3 : 2 : 4 respectively to buy a present for their friend. The cost of the present is $270.

(a) Calculate Megan's contribution.

(b) **(i)** If Eunice doubles her planned contribution and Megan halves her planned contribution, find out how much must Shannon contribute for the present.

(ii) **Hence**, write down the new contribution ratio.

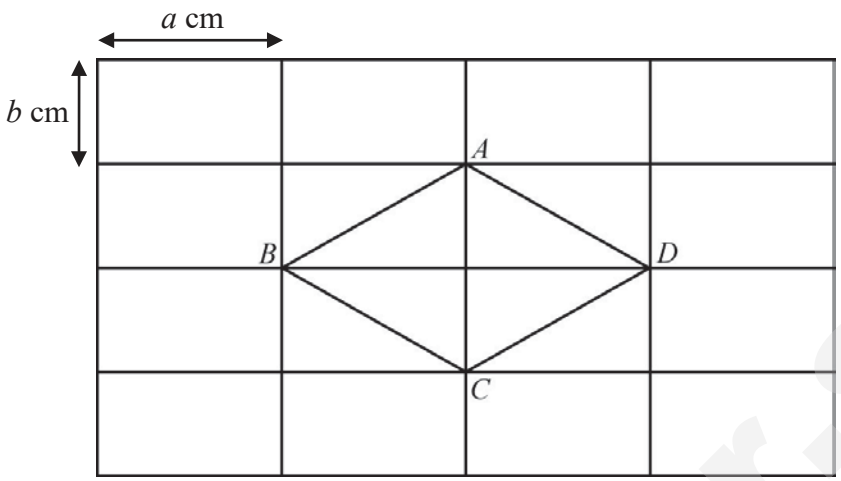
Answer (*a*) $..……..…..……..…….. [1]

(*b*)(i)$….....……..... [2]

(ii)….....**:**…...….**:**……..... [2]

For Examiner's Use

13 The figure below is made up of small rectangles each of length a cm and breadth b cm. Calculate in terms of a and b, the area of the region not enclosed by $ABCD$.



Answer …….……..……..…. cm^2 [2]

Section 2 [40 marks]

Answer **all** the questions.

For Examiner's Use

14 (a) Expand and simplify $3-(4-12x)$.

Answer (*a*) ……..…..……..…….. [2]

(b) Solve $\frac{5}{y-4}-\frac{2}{3y+1}=0$.

(*b*) ……..…..……..…….. [3]

(c) A faulty watch gains x seconds in one hour. Write down an expression for the number of minutes it would gain in y days. Give your answer in its simplest form.

(*c*) ……..…..……..…….. [2]

For Examiner's Use

15 (a) (i) Solve the inequality, $2(3+x) \leq 42 - 2x$.

Answer (*a*)(i)……..…….. [2]

(ii) Hence, write down the smallest value of x that satisfies the inequality $2(3+x) \leq 42 - 2x$ such that x is a perfect square.

(ii) x =…..……...…….. [1]

(b) Ms Lau went shopping for groceries at the supermarket. She intends to buy two bottles of juice at \$6.15 each, 5 packets of fresh milk at \$1.67 each, 2 loaves of bread at \$2.49 each and some fruits.

(i) Estimate the total cost Ms Lau will spend by rounding each of the prices to the nearest ten cents.

(*b*)(i) \$…...…..……...…….. [1]

(ii) If Ms Lau does not wish to exceed her budget of \$30, calculate how much money she should use to buy fruits.

(ii) \$……...…..……..…….. [1]

For Examiner's Use

16 (a) **(i)** It is given that $240 = 2^4 \times 3 \times 5$.
Express 2750 as a product of its prime factors, giving your answer in index notation.

Answer (*a*)(i)2750 =…..……..…….. [1]

(ii) Find the smallest positive integer k for which $240k$ is a multiple of 2750.

(ii)……...…..……..…….. [1]

(iii) Find the smallest positive integer n for which $\sqrt[3]{2750n}$ is a whole number.

(iii)...……...…..……..…….. [1]

(b) Nabilah bought 2 vanguard sheets each measuring 70 cm by 90 cm. She cut out square cards of identical size from the vanguard sheets such that there was no wastage.

(i) Calculate the largest possible length of the side of each square card that she can cut out.

(*b*)(i)……...…..……...…cm [2]

(ii) Find the total number of square cards she cut out such that there was no wastage.

(ii)……...…..……..…….. [2]

For Examiner's Use

17 Hongxiang bought 12 boxes of apples at $60 and each box contains x apples. 15% of the apples were rotten and could not be sold. He would make a profit of 70% if he sells each apple at 50 cents.

(a) Find in terms of x, the total number of apples Hongxiang bought.

Answer (*a*) .....apples[1]

(b) Calculate the total sales made from the apples that could be sold.

(*b*) $..... [2]

(c) Express the profit, in terms of x, as a percentage of the total amount paid for all 12 boxes of apples, assuming that all the remaining apples are sold.

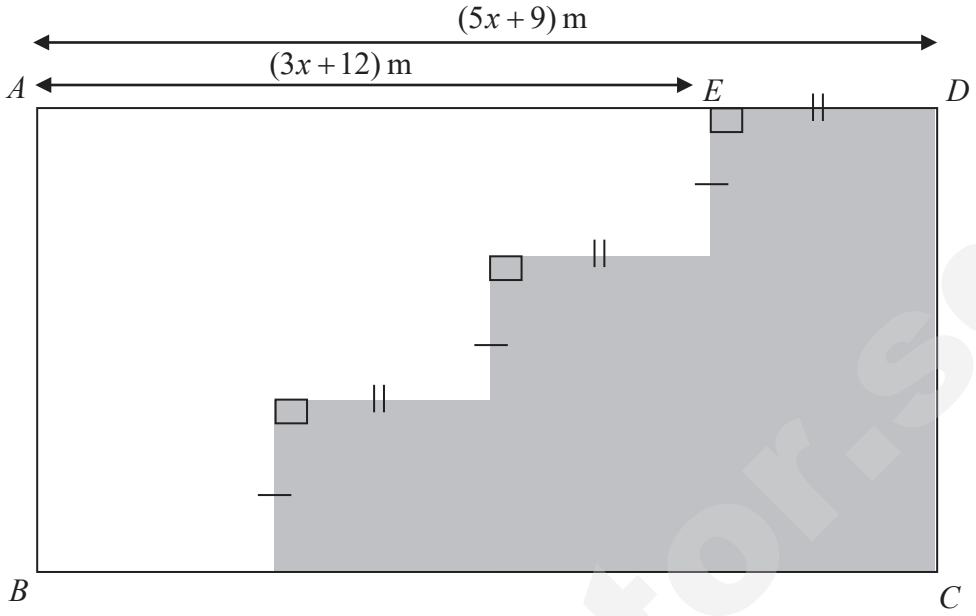
(*c*) ……% [2]

(d) Hence, find the number of apples per box.

(*d*) ……..apples [2]

For Examiner's Use

18 In the diagram, $ABCD$ is a rectangular field. $AD = (5x + 9)$ m, $AE = (3x + 12)$ m, and the perimeter of the field $ABCD$ is $(24x + 6)$ m.



Find an expression in terms of x for

(a) **(i)** the length of AB,

Answer (*a*)(i) ……..…..…….....m [2]

(ii) the length of DE.

(ii) ……...…....m [1]

(b) Given that $DE = \frac{3}{13} AD$, show that $11x = 66$.

(*b*) ……..……..……...…....[2]

(c) Solve the equation in part **(b)** to find the value of x.

(*c*) ……..…..……...…....[1]

(d) The shaded region shows the location of a flower bed. Calculate the area of the flower bed.

(*d*) ……...…..……...….....m^2 [1]

For Examiner's Use

19 Mr Ding who is an NSman is married with 2 children and his wife is not working. In 2016, he earned a gross annual income of $85 000. The data for the tax reliefs and the tax rates available are shown in the tables below.

	Reliefs
Personal	$3 000
Wife	$2 000
Each child	$4 000
CPF contributions	$15 000
Parent/Handicapped parent	$11 000
NSman	$5 000

	Tax Rates
First $40 000	$550
Next $40 000	7%
First $80 000	$3 350
Next $40 000	11.5%

Calculate

(a) (i) the amount of tax relief that he is entitled to,

Answer (*a*)(i) $.....[2]

(ii) his amount of taxable income,

(ii) $..... [2]

(b) Mr Ding told his wife he needs to pay a total income tax of $3 350. Showing your working clearly, explain why his calculation is wrong. State a possible reason for his error.

(*b*) .....

.....

.....[3]

END OF PAPER