Section A (40 marks)

Answer all the questions in this section.



Answer[1]

2. Arrange -3.103, $-3\frac{103}{1000}$, -3, -3.1 in ascending order.



4. In June 2011, James placed a sum of money in an investment fund that pays simple interest at a rate of 2.8% per annum.

By the end of June 2015, James had earned a total interest of \$5376. Find the amount of money James put in the investment fund in June 2011.

Answer \$ [2]

5. It is given that $p = 2^4 \times 3 \times 5$ and $q = 2 \times 5^3 \times 11$.

(a) Find the smallest positive integer *m* for which *pm* is a multiple of *q*.

Answer (*a*) *m* =[1]

(b) Find the smallest positive integer *n* for which \sqrt{pn} is a whole number.

Answer (*b*) *n* =[1]

- 6. Consider the sequence 24, 17, 10, 3, -4,
 - (a) Write down an expression, in terms of *n*, for the *n*th term of the sequence.

Answer (a)[1]

(**b**) **Hence** explain why –700 is not part of the sequence. Show your working clearly. *Answer*

7. Given that $\frac{10x-6y}{9x-8y} = \frac{2}{5}$, find the ratio of x : 2y.

8. A rectangular tray of brownie measures 48 cm by 20 cm by 8 cm. It is to be cut into small cubes of identical size such that there is no leftover.(a) Find the largest possible length of each cube.

Answer (*a*) cm [2]

(b) Hence, find the total number of cubes obtained.

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Answer (b)[1]

9. Solve $-\frac{5-7x}{4} = \frac{3}{2}(6-x)$.

Answer x =[3]

10. Using a computer software, Sam drew a triangle that had a base thrice that of its height, h cm. He then enlarged his original triangle such that the area of the triangle increased by 20%. Given that the area of his enlarged triangle was 115.2 cm², calculate the value of h.

11. (a) Factorise 2a(2+b)-4(b+2) completely.

Answer (*a*)[1]

(b) Expand and simplify $3x - \frac{1}{2} \left[4 + 5 \left(2 - 4x \right) \right]$.

Answer (*b*)[3]

- 12. The radius of a wheel of a unicycle is 0.2 m. A clown cycles at an average speed of 9 km/h during a performance.
 - (a) Convert 9 km/h into m/min.

Answer (a) m/min [1]

(**b**) Find the number of revolutions made by the wheel in 40 minutes, giving your answer correct to the nearest whole number.

6

Answer (b)[3]

13. In the diagram below, *ABCF* is a trapezium and *CDEF* is a parallelogram. AB = 5 cm, AG = 4 cm and AFE is a straight line.The ratio of the height of the parallelogram to the height of the trapezium is 3 : 2.

The area of the trapezium is half the area of the parallelogram.



(a) Find the height of the parallelogram.

Answer (a) cm [1]

(**b**) Find *DE*.

Answer (*b*) cm [3]

14. (a) If 4(ax-2)-1 = a(3+2x), find the value of *a* when x = 3.

(b) A piece of wire is 2 m long. Alvin cut it into three pieces. One piece is $\frac{3+4y}{21}$ m and the other is $\frac{2(4-5y)}{7}$ m long. Express the length of the remaining piece, in terms of y, and as a single fraction.

Answer (b) m [3]

9 Section B (40 marks)

Answer **all** the questions in this section.

- **15.** 120 students were surveyed to find out which of the three modes of transport the students prefer to use to travel to school. Their choices are presented in the pie chart shown below.
 - (a) Find the value of x. [2]
 - (b) Find the number of the students who go to school by car.



[1]

16. In the diagram below, PQR is a straight line and TQ is the angle bisector of $\angle PQS$. $\angle PTQ = 72^\circ$, $\angle PQT = (2b-16)^\circ$, $\angle TQS = (3a+3)^\circ$, $\angle QRS = (4c-20)^\circ$, PT // QS and QT // RS.



Find, stating the reasons clearly, the values of a, b and c.

[3]

17. Alvin bought 8 Toyo pens at x each. If he had bought Miffy pens which are cheaper by 15 cents each, he could have bought the same number of pens with two third the amount he spent on his Toyo pens.

(a) Form an equation in x and show that $x = 0.45$.	[3]
(\mathbf{u}) I offit all equation in x and show that $x = 0.15$.	[]

(b) Given that Alvin received a change of 40 cents when he paid for the Toyo pens, how much did Alvin pay the cashier? [1]

- 18. (a) A polygon has eight interior angles each of size 157° and the remaining exterior angles are each of size 22°.
 Find the number of sides. [2]
 - (**b**) The figure below shows a regular pentagon *ABCDE* and a regular hexagon *CDZYXW* which shares a common side *CD*.

(i) Find $\angle BCW$.

(ii) Explain why $\angle BCW$ cannot be an interior angle of a regular polygon. [1]



[2]

19.	Construct $\triangle DEF$ such that $DE = 8.5$ cm, $DF = 9.2$ cm and $\angle DEF = 65^{\circ}$.	[2]
	(a) Measure and write down the length of <i>EF</i> .	[1]
	(b) Construct the perpendicular bisector of EF.	[1]
	-(c) Construct the angle bisector of - <i>∠DFE</i> .	[1]
	-(d) The two bisectors intersect at K. Measure and write down the length of DK.	<u>[1]</u>

20. Answer the whole of this question on a sheet of graph paper.

Janice's weight, y kg, x months after signing up for a slimming program is shown in the table below.

x	2	6	10	16
у	76	68	60	48

(a) Using 1 cm to represent 1 month, draw a horizontal x-axis for $0 \le x \le 16$.

Using 2 cm to represent 10 kg, draw a vertical y-axis for $0 \le y \le 80$.	[2]]
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- (b) Use your graph to find
 - (i) Janice's weight when she first signed up for the slimming program, [1]
 - (ii) the number of months Janice took to lose 15 kg under the program. [1]
- (c) Find the gradient of the graph and explain what the gradient represents. [2]

21. The figure below shows an open cylindrical tin with diameter 10 cm that is partially filled with paint. The volume of the paint in the cylindrical tin is 1.65 litres.

(a) Find the depth of the paint in the cylindrical tin.

[2]

[2]

[3]

The paint in the cylindrical tin is poured into an open trough in the shape of a trapezoidal prism and completely fills the open trough with paint.

ABCD, *ADEH*, *EFGH* and *BCFG* are rectangular in shape. *CDEF* and *ABGH* are trapeziums.

AH = 6 cm, HE = 25 cm, BG = 10 cm and AB = 15 cm.

(**b**) Show that EF = 7 cm.

(c) Find the surface area of the open trough in contact with the paint.



22. Answer the whole of this question on a sheet of writing paper.

Mrs Sim plans to buy a branded watch for her husband's birthday. She is deciding between the local advertisement she saw for the Zorex watch sold in Meya Shopping Centre and the direct UK website for Zorex watches.

The information for both the newspaper and the website are provided on the next page.

It is given that Mrs Sim wants to get a 10-year warranty for the Zorex watch she intends to buy and she has the Ximi credit card.

- (a) Calculate the total cost Mrs Sim would spend on the Zorex watch if she were to buy it from Meya Shopping Centre.
- (**b**) Suggest whether Mrs Sim should buy the Zorex watch from Meya Shopping Centre or the direct UK website.

Justify your choice with appropriate calculations.

 $[\pounds 1 = S\$1.75]$

[4]



UK Website



18 END OF PAPER

Answer Key

1.40	
2. $-3.\dot{1}$, $-3.\dot{1}0\dot{3}$, $-3\frac{103}{1000}$, -3	
3a. $y \ge 30$	3b. <i>y</i> = 64
4. \$48 000	
5a. <i>m</i> = 275	5b. <i>n</i> = 15
6a. 31 – 7 <i>n</i>	
7.7:32	
8a. 4 cm	8b. 120
9. $x = 3\frac{2}{13}$	
10. $h = 8$	
11a. $2(2+b)(a-2)$	11b. 13 <i>x</i> -7
12a. 150 m/min	12b. 4775
13a. 6 cm	13b. 10 cm
14a. <i>a</i> = 3	14b. $\left(\frac{15+26y}{21}\right)m$
15a. $x = 98$	15b. 28
16. $a = 23, b = 44, c = 23$	
17a. $x = 0.45$	17b. \$4
18a. 16	18bi. 132°
19a. 8.6 cm (± 0.1)	19b. 5.5 cm (± 0.1)
20bi. 80 kg	20bii. 7.4
20c. –2 ; The gradient represent	s the weight loss per month.
21a. 21.0 cm	21c. 707 cm ²
22a. \$14 730	22b. UK website