Numbers – 2022 IGCSE 0580

1. June/2022/Paper-11/No.6

Write these numbers in order, starting with the smallest.

$\frac{6}{17}$ 34% $\frac{9}{25}$ 0.345

..... < ..... < ..... < ..... [2]

smallest

2. June/2022/Paper-11/No.9

Calculate $4^5 - 5^4$.

..... [1]

3. June/2022/Paper-11/No.10

Jason starts a run at 10.05 am and finishes at 1.02 pm.

Work out the time Jason takes to complete the run.

..... h ..... min [1]

4. June/2022/Paper-11/No.11

Calculate $\frac{1-0.7}{0.45-0.38}$, giving your answer correct to 4 significant figures.

..... [2]

5. June/2022/Paper-11/No.12

Kirsty changes \$380.80 into pounds (£) when £1 = \$1.19 .

Calculate the amount Kirsty receives.

£ ..... [2]

6. June/2022/Paper-11/No.14

Without using a calculator, work out $\frac{3}{7} - \frac{2}{21}$.

You must show all your working and give your answer as a fraction in its simplest form.

..... [2]

7. June/2022/Paper-11/No.19

Lin invests \$16 000 at a rate of r% per year simple interest.
At the end of 5 years, she has a total amount of \$17 920.

Find the value of r.

$r =$ ..... [3]

8. June/2022/Paper-11/No.20

22, 17, 12, 7, 2, …

(a) Find the next term of the sequence.

..... [1]

(b) Find the nth term of the sequence.

..... [2]

9. June/2022/Paper-11/No.21

Write down an irrational number with a value between 10 and 20.

..... [1]

10. June/2022/Paper-11/No.22

The table shows the population and area of three countries in 2020.

Country	Population	Area (km^2)
Nigeria	2.06×10^8	9.11×10^5
Comoros	8.70×10^5	1.86×10^3
Vietnam	9.73×10^7	3.10×10^5

(a) Calculate the difference in population between Nigeria and Vietnam.

..... [1]

(b) Which of Comoros or Vietnam has the greater population density?
You must show all your working.

$$\left[\text{Population density} = \frac{\text{population}}{\text{area}\,(\text{km}^2)}\right]$$

..... [3]

11. June/2022/Paper-12/No.1

Write the number six hundred and seven thousand five hundred and thirty-two in figures.

..... [1]

12. June/2022/Paper-12/No.2

61 62 63 64 65 66 67 68 69

From the list of numbers, write down

(a) a square number,

..... [1]

(b) a multiple of 13,

..... [1]

(c) a factor of 186,

..... [1]

(d) the prime numbers.

..... [2]

13. June/2022/Paper-12/No.5

This is Arania's method to divide 213 by $12\frac{1}{2}$ without using a calculator.

$$213 \div 12\frac{1}{2} = 426 \div 25$$
$$= 852 \div 50$$
$$= 1704 \div 100$$
$$= 17.04$$

Show how to use Arania's method to work out $135 \div 12\frac{1}{2}$ without using a calculator.

[2]

14. June/2022/Paper-12/No.7

Put one pair of brackets into each calculation to make it correct.

(a) $6 \times 7 - 5 + 4 = 16$ [1]

(b) $-2^2 + 24 \div 12 - 4 = 2$ [1]

15. June/2022/Paper-12/No.8

At noon, the temperature is 4 °C.
At midnight, the temperature is −9 °C.

Work out the difference in temperature between noon and midnight.

..... °C [1]

16. June/2022/Paper-12/No.13

(a) Find the value of $\sqrt{68} \times \sqrt{153}$.

..... [1]

(b) Find the value of $6789^{\frac{1}{3}}$.
Give your answer correct to 2 decimal places.

..... [2]

17. June/2022/Paper-12/No.14

Write the ratio $5 \times 10^{-1} : 2 : 3 \times 10^{1}$ in its simplest form.

..... : ..... : ..... [2]

18. June/2022/Paper-12/No.16

$33\frac{1}{3}\%$ π $\frac{1}{13}$ $343^{\frac{1}{3}}$ $\sqrt{3}$ 5.6×10^{-7}

Two of the numbers in this list are irrational.

Put a ring around each of these irrational numbers. [1]

19. June/2022/Paper-12/No.17

$9^x \times 9^2 = 9^{12}$

Find the value of x.

$x =$ ..... [1]

20. June/2022/Paper-12/No.18

By writing each number in the calculation correct to 1 significant figure, find an estimate for the value of

$$\frac{27-2.3^2}{845.4\times0.048}.$$

..... [2]

21. June/2022/Paper-12/No.19

The length, l metres, of a piece of rope is 30.7 m, correct to 1 decimal place.

Complete this statement about the value of l.

..... $\leqslant l <$ ..... [2]

22. June/2022/Paper-12/No.21

Find the lowest common multiple (LCM) of 24 and 28.

..... [2]

23. June/2022/Paper-12/No.23

Without using a calculator, work out $4\frac{1}{8} - 2\frac{5}{6}$.
You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

24. June/2022/Paper-13/No.1

Write the number one hundred and three thousand eight hundred and six in figures.

..... [1]

25. June/2022/Paper-13/No.7

Work out the value of $\frac{mk^3}{\sqrt{3}}$ when $m = 4$ and $k = 7$.

..... [2]

26. June/2022/Paper-13/No.18

Find the lowest common multiple (LCM) of 32 and 40.

..... [2]

27. June/2022/Paper-13/No.21

Dominic asks 30 students in his class if they are right-handed or left-handed.
7 students are left-handed.

Work out the expected number of left-handed students in the whole school of 960 students.

..... [2]

28. June/2022/Paper-13/No.22

Without using a calculator, work out $4\frac{1}{6} - 1\frac{7}{8}$.

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

29. June/2022/Paper-13/No.23

Solve the simultaneous equations.
You must show all your working.

$$4x - 3y = 26$$
$$5x + 6y = 13$$

$x =$ .....

$y =$ ..... [3]

30. June/2022/Paper-21/No.1

Write down a prime number between 30 and 40.

..... [1]

31. June/2022/Paper-21/No.2

Calculate $4^5 - 5^4$.

..... [1]

32. June/2022/Paper-21/No.3

Jason starts a run at 10.05 am and finishes at 1.02 pm.

Work out the time Jason takes to complete the run.

..... h ..... min [1]

33. June/2022/Paper-21/No.4

Calculate $\frac{1-0.7}{0.45-0.38}$, giving your answer correct to 4 significant figures.

..... [2]

34. June/2022/Paper-21/No.5

Kirsty changes \$380.80 into pounds (£) when £1 = \$1.19.

Calculate the amount Kirsty receives.

£ ..... [2]

35. June/2022/Paper-21/No.6

Write 180 as a product of its prime factors.

..... [2]

36. June/2022/Paper-21/No.7

Without using a calculator, work out $\frac{3}{7} - \frac{2}{21}$.

You must show all your working and give your answer as a fraction in its simplest form.

..... [2]

37. June/2022/Paper-21/No.8

$s = \frac{1}{2}at^2$

(a) Work out the value of s when $a = 0.9$ and $t = 4$.

$s =$ ..... [1]

(b) Rearrange the formula to find t in terms of s and a.

$t =$ ..... [2]

38. June/2022/Paper-21/No.10

22, 17, 12, 7, 2, …

(a) Find the next term of the sequence.

..... [1]

(b) Find the nth term of the sequence.

..... [2]

39. June/2022/Paper-21/No.12

The interior angles of a pentagon are in the ratio 4 : 5 : 5 : 7 : 9.

Find the size of the largest angle.

..... [3]

40. June/2022/Paper-21/No.13

Work out $2\times10^{100}-2\times10^{98}$, giving your answer in standard form.

..... [2]

41. June/2022/Paper-21/No.14

A train passes through a station at a speed of 108 km/h.
The length of the station is 120 m.
The train takes 7 seconds to completely pass through the station.

Work out the length of the train.

..... m [3]

42. June/2022/Paper-21/No.25

w is proportional to the square root of y.
y is inversely proportional to x.
When $x = 4$, $y = 16$ and $w = 8$.

Find w in terms of x.

$w =$ ..... [3]

43. June/2022/Paper-22/No.1

At noon, the temperature is 4 °C.
At midnight, the temperature is −9 °C.

Work out the difference in temperature between noon and midnight.

..... °C [1]

44. June/2022/Paper-22/No.3

Figs cost 43 cents each.
Lyra has $5 to buy some figs.

Calculate the largest number of figs Lyra can buy and the amount of change, in cents, she receives.

..... figs and ..... cents change [3]

45. June/2022/Paper-22/No.4

Find the value of $\sqrt{68} \times \sqrt{153}$.

..... [1]

46. June/2022/Paper-22/No.7

The price of a coat is $126.
In a sale, this price is reduced by 18%.

Find the sale price of the coat.

$ ..... [2]

47. June/2022/Paper-22/No.8

The nth term of a sequence is $n^2 + 12$.

Find the first three terms of this sequence.

..... , ... , ... [2]

48. June/2022/Paper-22/No.11

Find the value of p when $6^p \times 6^4 = 6^{28}$.

$p =$ ..... [1]

49. June/2022/Paper-22/No.13

Without using a calculator, work out $4\frac{1}{8} - 2\frac{5}{6}$.
You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

50. June/2022/Paper-22/No.14

Carlos invests \$4540 at a rate of r% per year compound interest.
At the end of 10 years he has earned \$1328.54 in interest.

Calculate the value of r.

$r =$ ..... [3]

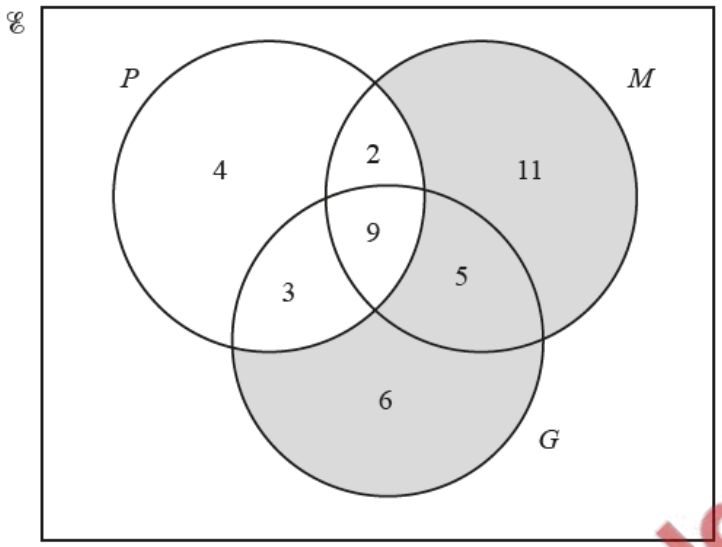
51. June/2022/Paper-22/No.15

Find the highest common factor (HCF) of $12a^3b$ and $20a^2b^2$.

..... [2]

52. June/2022/Paper-22/No.16

The Venn diagram shows the number of students in a class of 40 who study physics (P), mathematics (M) and geography (G).



(a) Use set notation to describe the shaded region.

..... [1]

(b) Find $n((P \cap G) \cup M')$.

..... [1]

(c) A student is chosen at random from those studying geography.

Find the probability that this student also studies physics or mathematics but not both.

..... [2]

53. June/2022/Paper-22/No.18

(a) y is directly proportional to the cube root of $(x+1)$.
When $x = 7$, $y = 1$.

Find the value of y when $x = 124$.

$y =$ ..... [3]

(b) F is inversely proportional to the square of d.

Explain what happens to F when d is halved.

..... [1]

54. June/2022/Paper-22/No.19

$$f(x) = 7x - 8 \qquad g(x) = \frac{4}{x} + 5 \qquad h(x) = 2^x + 1$$

(a) Find $f^{-1}(x)$.

$f^{-1}(x) =$ ..... [2]

(b) Find the value of x when $h(x) = g\left(\frac{1}{3}\right)$.

$x =$ ..... [2]

55. June/2022/Paper-22/No.21

The nth term of a sequence is $an^2 + bn - 4$.

The first term is -3 and the second term is 2.

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [5]

56. June/2022/Paper-23/No.2

Work out the value of $\frac{m\,k^3}{\sqrt{3}}$ when $m = 4$ and $k = 7$.

..... [2]

57. June/2022/Paper-23/No.5

The nth term of a sequence is $n^2 - 1$.

Find the first three terms of this sequence.

..... , ... , ... [2]

58. June/2022/Paper-23/No.6

Simplify.

(a) $y^3 \div y^5$

..... [1]

(b) $7x^0$

..... [1]

59. June/2022/Paper-23/No.8

Without using a calculator, work out $\frac{2}{9} \div \frac{5}{6}$.

You must show all your working and give your answer as a fraction in its simplest form.

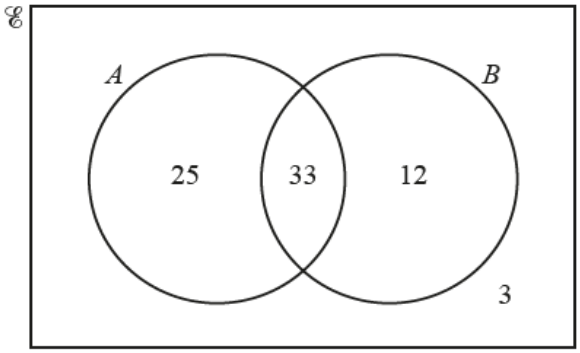
..... [2]

60. June/2022/Paper-23/No.9

Change 300 m/min to km/h.

..... km/h [2]

61. June/2022/Paper-23/No.10



Find $\mathrm{n}(A \cap B)'$.

..... [1]

62. June/2022/Paper-23/No.12

f is a common factor of 14 and 28.
m is a common multiple of 10 and 25.
p is a prime number.

Work out the largest possible value of $\frac{f}{mp}$.

..... [4]

63. June/2022/Paper-23/No.14

Find the nth term of this sequence.

8, 17, 32, 53, 80, ...

..... [2]

64. June/2022/Paper-23/No.15

Solve.

$12x - 3 \geqslant 4x + 13$

..... [2]

65. June/2022/Paper-23/No.19

$f(x) = kx^2$ $\quad g(x) = \frac{1}{x}$ $\quad h(x) = \frac{7x-2}{5}$ $\quad j(x) = \frac{3-10x}{14}$

(a) $f(-5k) = 675$

Find the value of k.

$k =$ ..... [2]

(b) Find $gh(x)$.

..... [1]

(c) Find $h^{-1}(x) + j(x)$.
Give your answer in its simplest form.

..... [4]

66. June/2022/Paper-23/No.21

Neha has a piece of ribbon of length 23 cm, correct to the nearest cm.
From this ribbon she cuts off a piece with length 87 mm, correct to the nearest mm.

Work out the lower bound and the upper bound for the length of the remaining ribbon.
Give your answer in centimetres.

Lower bound = ... cm

Upper bound = ...cm [3]

67. June/2022/Paper-23/No.24

y is inversely proportional to the cube of $(x-1)$.
$y = 9.45$ when $x = 3$.

Find y when $x = 4$.

$y =$ ..... [3]

68. June/2022/Paper-31/No.1

(a) Write the number six and a half million in figures.

..... [1]

(b) Write 6538 correct to the nearest ten.

..... [1]

(c) Work out $6 \times 5 + 12 \div 3$.

..... [1]

(d) 9 16 18 29 57 64 87 96

From this list of numbers, write down

(i) a factor of 48,

..... [1]

(ii) a cube number,

..... [1]

(iii) a prime number.

..... [1]

(e) Find the value of $\sqrt{0.001225}$.

..... [1]

(f) Find the reciprocal of 8.

..... [1]

(g) Find the value of 8^0.

..... [1]

(h) **(i)** Write 180 as a product of its prime factors.

..... [2]

(ii) Find the lowest common multiple (LCM) of 160 and 180.

..... [2]

(i) The mass of an aircraft, m tonnes, is 473 tonnes, correct to the nearest tonne.

Complete this statement about the value of m.

..... $\leqslant m <$ ..... [2]

69. June/2022/Paper-31/No.3

Sachin, his wife and three children go on a coach holiday.

(a) Each adult ticket costs $375 and each child ticket costs $194.

Work out the total cost of the tickets.

$ ..... [2]

(b) A meal costs $110 plus a service charge of 18%.

Calculate the total cost of the meal.

$ ..... [2]

(c) One day, the temperature at midday is 16 °C.
At midnight the temperature has fallen by 23 °C.

Work out the temperature at midnight.

..... °C [1]

(d) Sachin spends $768 on holiday.
He spends $\frac{3}{8}$ of this amount on presents.

Find how much he spends on presents.

$ ..... [1]

(e) There are 604 passengers on the holiday.

(i) The coach company uses coaches which can carry 46 passengers.

Work out the number of coaches needed.

..... [2]

(ii) 268 of the 604 passengers are women.

Find the percentage of the passengers that are women.

..... % [1]

(f) A coach travels at an average speed of 54 km/h.

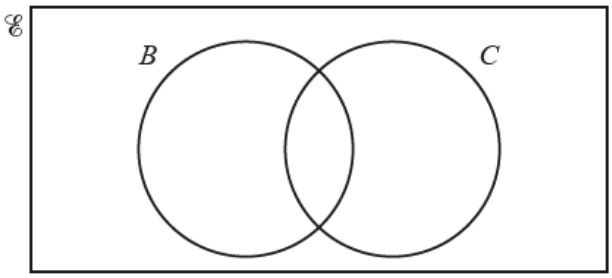
Find how long, in hours and minutes, this coach takes to travel 126 km.

..... h ..... min [3]

70. June/2022/Paper-31/No.7(b)

(b) 140 students choose which subjects they want to study.

- 122 students choose biology (B).
- 55 students choose chemistry (C).
- 2 students do not choose biology and do not choose chemistry.



(i) Complete the Venn diagram.

[2]

(ii) One of these students is picked at random.

Find the probability that this student chooses biology and chemistry.

..... [1]

71. June/2022/Paper_32/No.1(a)

Antonio has a shop near the beach.

(a) (i) He makes a tally of the number of ice creams he sells on Friday.

𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 |||

Work out the number of ice creams he sells on Friday.

..... [1]

(ii) 15 of the ice creams he sells on Friday are vanilla.

Work out the fraction of ice creams he sells on Friday that are vanilla.
Give your answer in its simplest form.

..... [1]

(iii) He buys tubs of ice cream for his shop in the ratio vanilla : chocolate = 11 : 7.
He buys 28 tubs of chocolate ice cream.

Work out how many tubs of vanilla ice cream he buys.

..... [2]

72. June/2022/Paper_32/No.1c(i)

(i) Antonio buys beach balls for $2.50 each and sells them for $4.20 each.

Work out the percentage profit he makes on each beach ball.

..... % [2]

73. June/2022/Paper_32/No.6(b),(c),(d)

(b) Katya takes some coins to the bank.
The table shows the number of each type of coin.

Type of coin	Number of coins
1 cent	12
5 cent	23
10 cent	17
25 cent	9
50 cent	7
1 dollar	24

Work out the total amount of money Katya takes to the bank.
Give your answer in dollars.

$ ..... [2]

(c) Adam changes $700 into euros at the bank.
The exchange rate is $1 = 0.904 euros.

Work out the amount Adam receives.

..... euros [1]

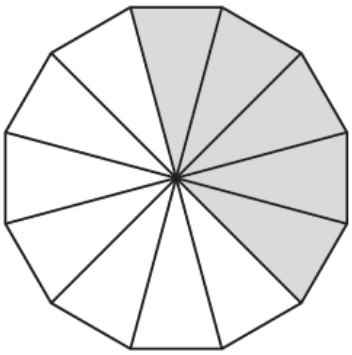
(d) Clara invests $8500 for 4 years at a rate of 1.7% per year simple interest.

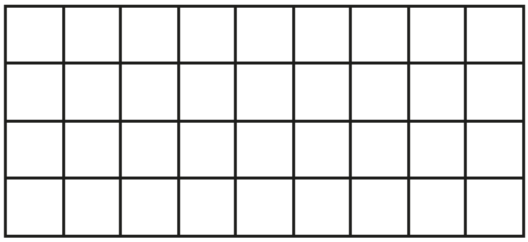
Calculate the total interest earned during the 4 years.

$ ..... [2]

74. June/2022/Paper_32/No.7

(a)





Shade some squares so that both shapes have the same fraction shaded. [2]

(b) Here is a pattern.

 ....

Position number 1 is a  .

Position number 2 is a  .

(i) Draw the next two shapes in this pattern. [1]

(ii) What do the position numbers of the shape  have in common?

..... [1]

(iii) Pierre says that the shape in position number 99 is a  .

Explain why he is correct.

.....

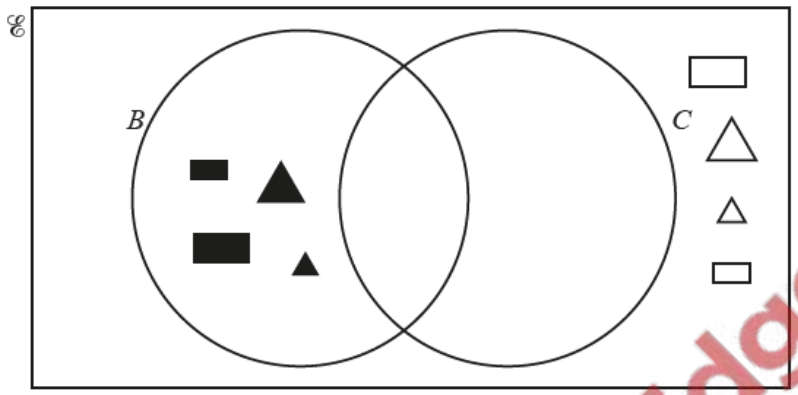
..... [2]

(c) $\mathscr{E}$ = { ●, ○, •, ∘, ▲, △, ▲, △, ▬, ▭, ▬, ▭ }

This universal set has twelve elements.
Each shape is:

- a circle, C, or a triangle, T, or a rectangle, R
- large, L, or small, S
- black, B, or white, W.

(i)



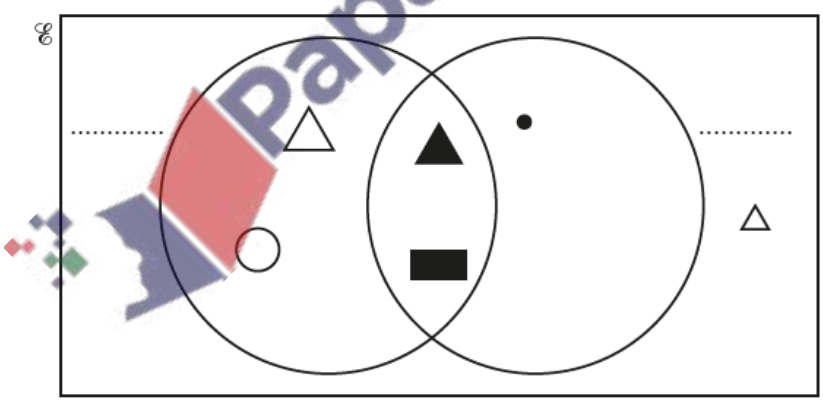
The triangles and rectangles are drawn in the Venn diagram.

(a) Draw the four circles to complete the Venn diagram. [1]

(b) Find $n(B \cup C)$.

..... [1]

(ii) Six of the twelve shapes are drawn in another Venn diagram.



Complete the Venn diagram by:

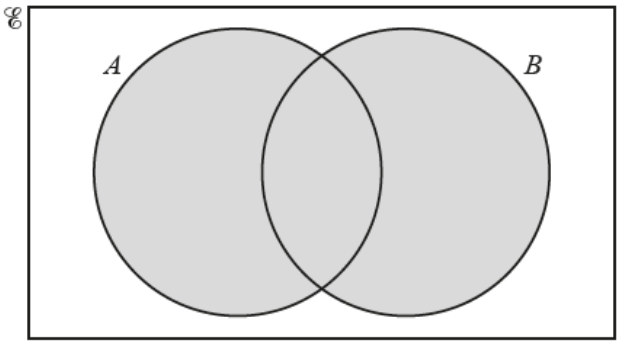
- labelling the sets

and

- drawing the shapes ●, ○, ▲, ▭, ▬ and ▭ . [3]

75. June/2022/Paper_33/No.2

(a)



Use set notation to describe the shaded region.

..... [1]

(b) $\mathscr{E} = \{x : x \text{ is a natural number} \leqslant 16\}$

(i) Write down all the square numbers in the universal set, $\mathscr{E}$.

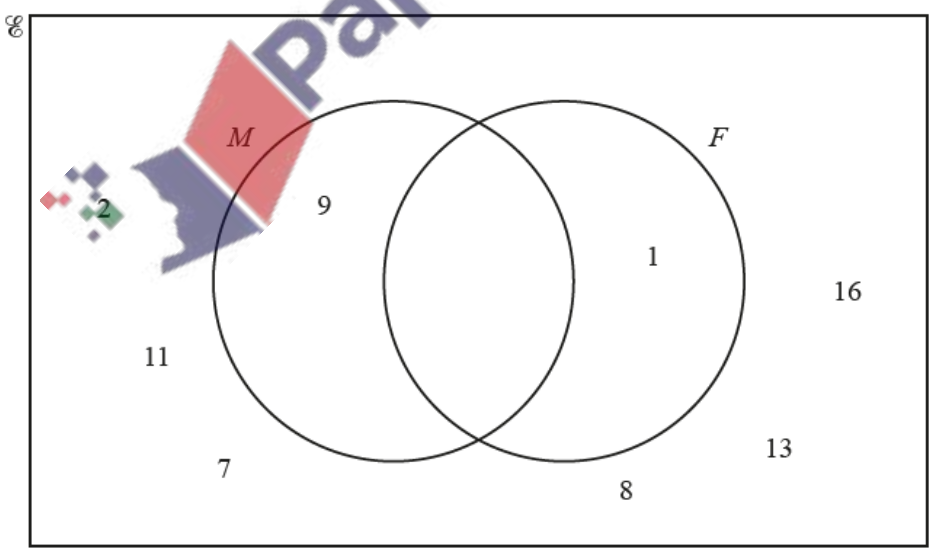
..... [2]

(ii) Write down the six prime numbers in the universal set, $\mathscr{E}$.

....., ..., ..., ..., ..., ... [2]

(iii) $M = \{x : x \text{ is a multiple of } 3\}$
$F = \{x : x \text{ is a factor of } 15\}$

(a) Complete the Venn diagram to show the elements of these sets.



[2]

(b) Write down all the odd numbers that are not in set M and not in set F.

..... [1]

(c) Find $n(M \cap F)$.

..... [1]

(d) A number is chosen at random from the universal set, $\mathscr{E}$.

Find the probability that this number is in set F.

..... [1]

76. June/2022/Paper_33/No.3

Mr Zhang, his wife and three children go on a holiday from Shanghai to Auckland.

(a) The flight for an adult costs \$630.
The cost for a child is $\frac{5}{8}$ of the adult cost.

Show that the total cost of the flight for the family is \$2441, correct to the nearest dollar.

[3]

(b) The plane leaves Shanghai at 2005 local time on 13th November.
The plane stops for 2 hours 30 minutes in Sydney.
The plane lands in Auckland at 1725 local time on 14th November.
The local time in Auckland is 5 hours ahead of the local time in Shanghai.

(i) Work out how long the plane is flying, in hours and minutes.

..... h ..... min [3]

(ii) Write your answer to **part (b)(i)** in hours, correct to 3 decimal places.

..... h [1]

(iii) The flight distance from Shanghai to Sydney is 7882 km.
The flight distance from Sydney to Auckland is 2156 km.

Find the total distance the plane flies.

..... km [1]

(iv) Calculate the average speed of the plane when it is flying.

..... km/h [2]

(c) The holiday expenses are in the ratio

hotel : car hire : food = 8 : 5 : 6.

The cost of the hotel is $2400.

Show that the total of the holiday expenses is $5700.

[2]

77. June/2022/Paper_33/No.4(b)

(b) A sequence of diagrams is made by joining these polygons.

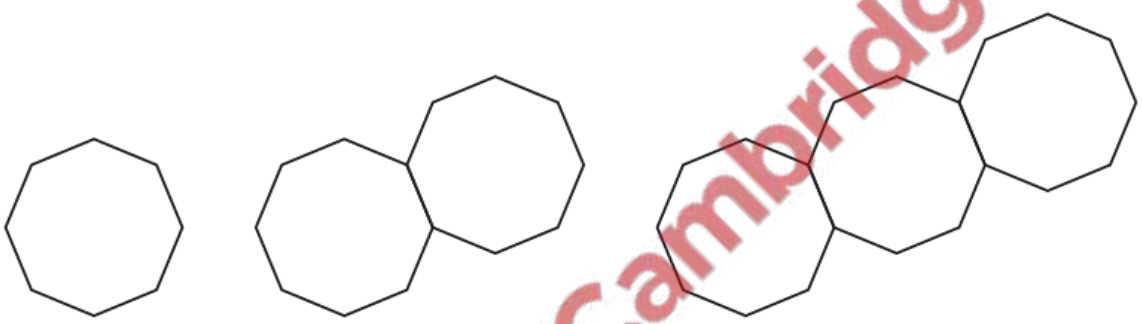


Diagram 1 Diagram 2 Diagram 3

(i) Complete the table.

Diagram number	1	2	3	4	5
Number of lines	8	15			

[3]

(ii) Write down the term to term rule for the number of lines in the sequence.

..... [1]

(iii) Work out the number of lines in Diagram 9.

..... [1]

(iv) Find an expression, in terms of n, for the number of lines in Diagram n.

..... [2]

(v) Diagram k has 113 lines.

Find the value of k.

$k =$ ..... [2]

78. June/2022/Paper_33/No.9

Ahmed owns a company.

(a) **(i)** Each year he earns \$56 000 plus 3% of the year's profit.

Calculate the amount he earns in a year when the profit is \$320 600.

\$ ..... [2]

(ii) In the following year the profit is \$347 851.

Calculate the percentage increase in the profit.

..... % [2]

(b) Ahmed employs three people, Budi, Citra and Dian.
Budi earns \$17 000, Citra earns \$13 600 and Dian earns \$6800.

Find the ratio of their earnings in its simplest form.

Budi : Citra : Dian = ... : ..... : ..... [2]

(c) Ahmed buys materials from China costing 7560 yuan.

Work out the cost of the materials in dollars when the exchange rate is \$1 = 7.06 yuan.
Give your answer correct to the nearest dollar.

\$ ..... [2]

(d) Ahmed borrows \$8 000 for 3 years at a rate of 5% per year compound interest.

Calculate the amount of interest he will pay at the end of the 3 years.

\$ ..... [3]

79. June/2022/Paper_41/No.2

(a) Alex, Bobbie and Chris share strawberries in the ratio Alex : Bobbie : Chris = 3 : 2 : 2.
Chris receives 12 strawberries.

Calculate the total number of strawberries shared.

..... [2]

(b) In a sale, a shop reduces all prices by 12%.

(i) Dina buys a book which has an original price of $6.50 .

Calculate how much Dina pays for the book.

$ ..... [2]

(ii) Elu pays $11 for a toy.

Calculate the original price of the toy.

$ ..... [2]

(c) Feri invests some money.
The rate of interest for the first year is 2.5%.
At the end of the second year the overall percentage increase of Feri's investment is 6.6%.

Find the rate of interest for the second year.

..... % [2]

(d) A radioactive substance decays at an exponential rate of 2% per day.
The initial mass is 80 g.

(i) Find the mass at the end of 5 days.

..... g [2]

(ii) Find how many **more** whole days, after day 5, it takes for the mass to reduce to less than 67 g.

..... [3]

80. June/2022/Paper_41/No.3

(a) Geeta buys x apples, $(x+7)$ oranges and $(2x-1)$ bananas.
The total number of pieces of fruit Geeta buys is 30.

(i) Find the number of apples Geeta buys.

..... [3]

(ii) The cost of one apple is 15 cents.
The cost of one orange is 18 cents.
The total cost of all the fruit is \$5.55 .

Find the cost, in cents, of one banana.

..... cents [3]

(b) **(i)** Solve.

$$\frac{3w}{16} - 1 = \frac{1}{2}$$

$w =$ ..... [2]

(ii) $\frac{3(2^{-y})}{16} - 1 = \frac{1}{2}$

Find the value of y.

$y =$ ..... [2]

(c) **(i)** Solve the simultaneous equations.

$$2p+q=2$$
$$p-q=-\frac{1}{2}$$

$p =$ .....

$q =$ ..... [2]

(ii) Hence, for $0° \leqslant u \leqslant 360°$ and $0° \leqslant v \leqslant 360°$, solve the simultaneous equations.

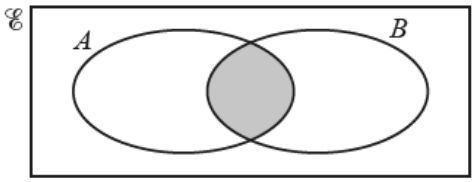
$$2\sin u+\cos v=2$$
$$\sin u-\cos v=-\frac{1}{2}$$

$u =$ ..... or $u =$ .....

$v =$ ..... or $v =$ ..... [4]

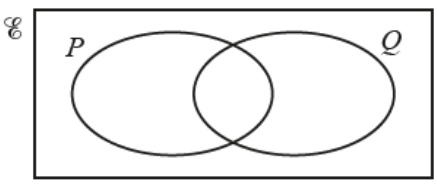
81. June/2022/Paper_41/No.8

(a) **(i)** Use set notation to describe the shaded region in the Venn diagram.

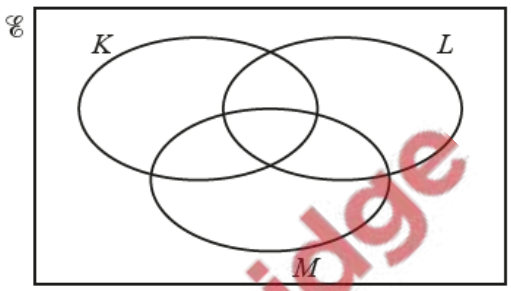


..... [1]

(ii) Shade the correct region in each Venn diagram.



$Q \cup P'$



$(K \cup L) \cap M'$

[2]

(b)

V	E	N	N	D	I	A	G	R	A	M

The diagram shows 11 cards.

(i) One of these cards is chosen at random.

Write down the probability that the letter on the card is **not** A.

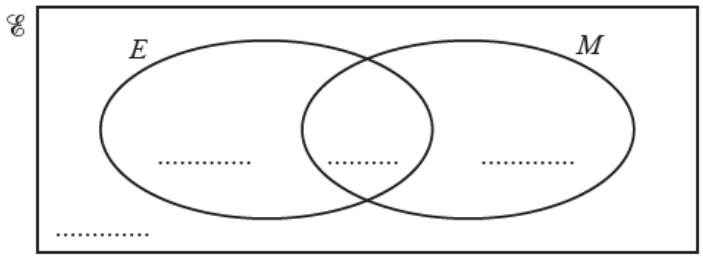
..... [1]

(ii) A card is chosen at random from these 11 cards and then replaced.
A second card is then chosen at random.

Find the probability that exactly one card has the letter N.

..... [3]

(c)



50 students are asked if they like English (E) and if they like mathematics (M).
3 say they do not like English and do not like mathematics.
33 say they like English.
42 say they like mathematics.

(i) Complete the Venn diagram. [2]

(ii) A student is chosen at random.

Find the probability that this student likes English and likes mathematics.

..... [1]

(iii) Two students are chosen at random.

Find the probability that they both like mathematics.

..... [2]

(iv) Two students who like English are chosen at random.

Find the probability that they both also like mathematics.

..... [2]

82. June/2022/Paper_42/No.1

(a) Find the lowest common multiple (LCM) of 30 and 75.

..... [2]

(b) Share \$608 in the ratio 4 : 5 : 7.

\$ .....

\$ .....

\$ ..... [3]

(c) Work out $\frac{6.39\times10^4}{2.45\times10^6}$.

Give your answer in standard form.

..... [2]

(d) Write $0.\dot{2}\dot{7}$ as a fraction.

..... [1]

(e) A stone has volume 45 cm^3 and mass 126 g.
Find the density of the stone, giving the units of your answer.

[Density = mass ÷ volume]

.... [2]

83. June/2022/Paper_42/No.6

(a) At a festival, 380 people out of 500 people questioned say that they are camping.
There are 55 300 people at the festival.

Calculate an estimate of the total number of people camping at the festival.

..... [2]

(b) 12 friends travel to the festival.
5 travel by car, 4 travel by bus and 3 travel by train.
Two people are chosen at random from the 12 friends.

Calculate the probability that they travel by different types of transport.

..... [4]

(c) Arno buys a student ticket for $43.68 .
This is a saving of 16% on the full price of a ticket.

Calculate the full price of a ticket.

$ ..... [2]

(d) At a football match, there are 29 800 people, correct to the nearest 100.

(i) At the end of the football match, the people leave at a rate of 400 people per minute, correct to the nearest 50 people.

Calculate the lower bound for the number of minutes it takes for all the people to leave.

..... min [3]

(ii) At a cricket match there are 27 500 people, correct to the nearest 100.
Calculate the upper bound for the difference between the number of people at the football match and at the cricket match.

..... [2]

84. June/2022/Paper_43/No.1

Here is part of a bus timetable.

Abbots	06 50	08 25	09 20
Callet	07 12	08 47	09 42
North Moor	07 30	09 05	10 00
South Moor	07 37	09 12	10 07
Centre Point	08 00	09 35	10 30

(a) Rashid catches the 09 20 bus at Abbots.

Find the time the bus arrives at South Moor.

..... [1]

(b) Annisa leaves home at 8.27 am and takes 25 minutes to walk to the bus stop at Callet.
She catches the next bus to Centre Point.

Find the total time, in minutes, for her journey from leaving home to arriving at Centre Point.

..... min [2]

(c) The distance from Abbots to Centre Point is 29.4 km.
Each bus takes the same time for the journey.

Calculate the average speed of a bus for this journey.
Give your answer in kilometres per hour.

..... km/h [2]

(d) On one journey, all 56 seats on the bus are filled.
The ratio of adults to children on this journey is adults : children = 5 : 3.
The cost for an adult ticket is $2.80 .
The cost for a child ticket is $\frac{3}{4}$ of the adult cost.

Work out the total cost of the tickets for this journey.

$ ..... [4]

85. June/2022/Paper_43/No.3

(a) The table shows the numbers of tigers reported to be living in the wild in the year 2014 in some countries.

Country	Number
India	2226
Indonesia	371
Nepal	198
Bangladesh	106

(i) Using the table,

(a) find the number of tigers in Nepal as a percentage of the number of tigers in Bangladesh,

..... % [1]

(b) find the ratio tigers in Bangladesh : tigers in Indonesia : tigers in India, giving your answer in its simplest form.

..... : ..... : ..... [2]

(ii) Five years later, the number of tigers reported in India was 2967.

Find the percentage increase in the population of tigers in India.

..... % [2]

(iii) The number of tigers in India in the year 2014 is approximately 30.48% greater than in the year 2010.

Find the number of tigers in India in the year 2010.
Give your answer correct to the nearest integer.

..... [3]

(b) At the start of June, a hive has a population of 2000 bees.
Three months after the start of June the hive has a population of 2662 bees.

The population of this hive can be calculated using the formula

$$P = ab^x,$$

where P is the population of the hive x months after the start of June.

By finding the value of a and the value of b, calculate the population of the hive 7 months after the start of June.
Give your answer correct to the nearest integer.

..... [5]