Numbers – 2021 IGCSE 0580

1. Nov/2021/Paper_11/No.1

Fraction		Decimal		Percentage
$\frac{1}{2}$	=	0.5	=	50
.....	=	0.25	=	.....
$\frac{1}{5}$	=	.....	=	20

Complete the table. [3]

2. Nov/2021/Paper_11/No.6

(a) Change 2.7 kilometres into metres.

..... m [1]

(b) Find the number of hours in 5 days.

..... h [1]

3. Nov/2021/Paper_11/No.7

Hank flies from Los Angeles to Shanghai.

(a) The flight departs on Friday 22 July at 21 40.
The flight takes 13 hours 35 minutes.
The local time in Shanghai is 15 hours ahead of the local time in Los Angeles.

Find the day, date and time in Shanghai when Hank's flight arrives.

Day ....., Date ....., Time ..... [3]

(b) The cost of the flight is $920.
The exchange rate is $1 = 6.87 Chinese yuan.

Find the cost of the flight in yuan.

..... yuan [1]

4. Nov/2021/Paper_11/No.10

Chung invests $2460 at a rate of 3.5% per year simple interest.

Calculate the total amount of his investment at the end of 4 years.

$ ..... [3]

5. Nov/2021/Paper_11/No.15

Sophie buys 73 books for her school.
Each book costs $21.95 .

(a) By rounding each number correct to 1 significant figure, estimate the total cost of these books.

$ ..... [1]

(b) Write down whether this estimate is greater or less than the exact cost.

Explain how you decide, without working out the exact cost.

..... because .....

..... [1]

6. Nov/2021/Paper_11/No.18

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

..... [3]

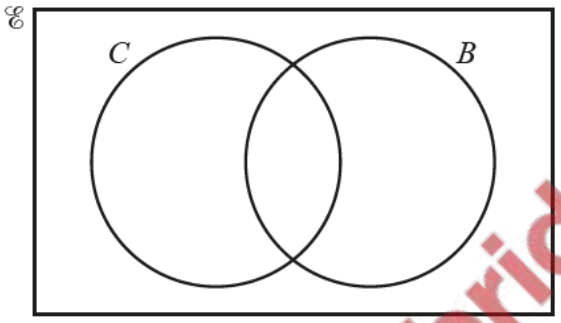
7. Nov/2021/Paper_11/No.20

There are 50 families in a village.

C = {families who own a car}
B = {families who own a bicycle}

23 families own a car.
10 families own a car and a bicycle.
6 families own no cars and no bicycles.

(a) Complete the Venn diagram.



[2]

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

..... [1]

8. Nov/2021/Paper_12/No.1

(a) Write the number four hundred thousand and four hundred in figures.

..... [1]

(b) Write 60 287 correct to the nearest ten.

..... [1]

9. Nov/2021/Paper_12/No.2

Find the value of $\sqrt{345.96}$.

..... [1]

10. Nov/2021/Paper_12/No.4

(a) Write 9% as a decimal.

..... [1]

(b) Write 0.6 as a fraction in its simplest form.

..... [1]

11. Nov/2021/Paper_12/No.5

Write down the reciprocal of 20.

..... [1]

12. Nov/2021/Paper_12/No.8

The temperature at midnight is −8.5 °C.
The temperature at 11 am is −1 °C.

Work out the difference between the temperature at midnight and the temperature at 11 am.

..... °C [1]

13. Nov/2021/Paper_12/No.9

Change 0.3 metres into centimetres.

..... cm [1]

14. Nov/2021/Paper_12/No.13

The price of a coat is 84.60 euros.

Find the price of the coat in dollars when the exchange rate is 1 euro = \$1.15 .

\$ ..... [1]

15. Nov/2021/Paper_12/No.15

Change 2.15 hours into minutes.

..... min [1]

16. Nov/2021/Paper_12/No.19

Angelique rents a room for a party.
The cost of renting the room is $15.50 for the first hour and then $7.25 for each additional hour.
She pays $95.25 in total.

Work out the total number of hours she rents the room for.

..... hours [3]

17. Nov/2021/Paper_12/No.20

Without using a calculator, work out $\frac{1}{3} \div \frac{7}{6} + \frac{1}{5}$.

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

..... [4]

18. Nov/2021/Paper_12/No.22

In a group of 650 people, 117 are left-handed.

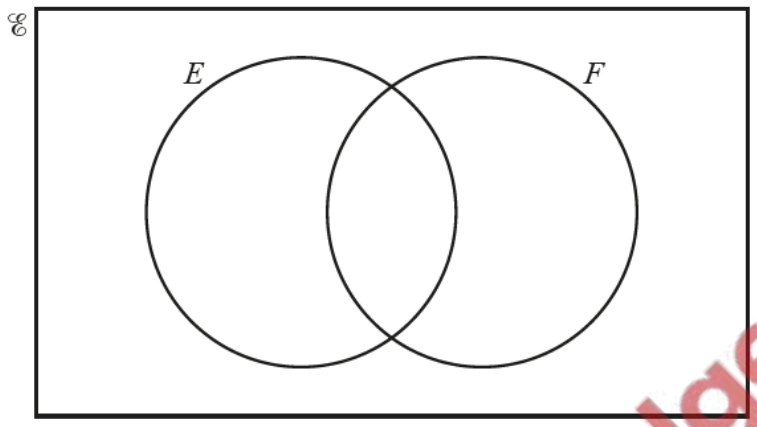
Find the expected number of left-handed people in a group of 5000 people.

..... [2]

19. Nov/2021/Paper_12/No.23

(a) At an airport, 216 people are asked whether they speak English (E) or French (F).

125 speak English.
43 speak both English and French.
61 do not speak English or French.

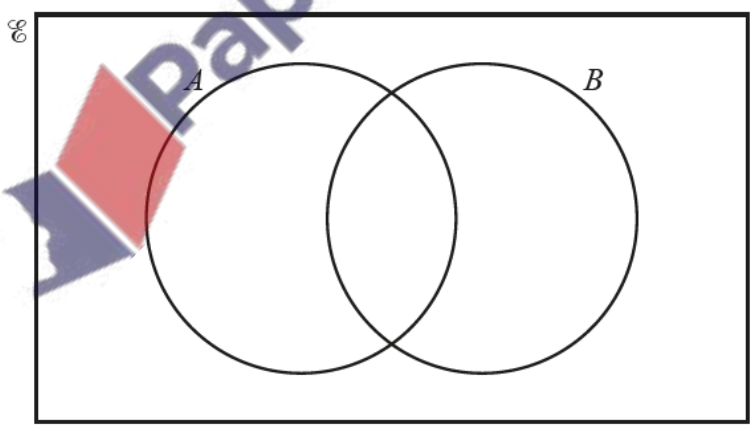


(i) Complete the Venn diagram. [2]

(ii) Find n(F).

..... [1]

(b)



On this Venn diagram, shade the region $A \cap B$. [1]

20. Nov/2021/Paper_13/No.1

Write

(a) $\frac{1}{2}$ as a percentage,

..... % [1]

(b) 0.7 as a fraction,

..... [1]

(c) $\frac{11}{20}$ as a decimal.

..... [1]

21. Nov/2021/Paper_13/No.3

Find the number of minutes in $4\frac{1}{2}$ hours.

..... min [1]

22. Nov/2021/Paper_13/No.8

The temperature at midnight was −8 °C.
The temperature at noon is 6 °C.

(a) Work out the difference between these two temperatures.

..... °C [1]

(b) The temperature at 7 am is 5 °C higher than the temperature at midnight.

Work out the temperature at 7 am.

..... °C [1]

23. Nov/2021/Paper_13/No.10

Write 26 g as a percentage of 208 g.

..... % [1]

24. Nov/2021/Paper_13/No.11

11 13 15 17 19

From this list, write down the number that is both a prime number and a factor of 195.

..... [1]

25. Nov/2021/Paper_13/No.12

(a) $=$ $\neq$ $>$ $<$

Put a ring around each of the symbols that make this statement correct.

0.5 ..... 5% [1]

(b) Insert one pair of brackets to make this statement correct.

$7 - 3 - 1 + 2 = 7$ [1]

26. Nov/2021/Paper_13/No.16

Nina changes 153 euros into dollars when the exchange rate is \$1 = 0.9 euros.

Calculate the amount Nina receives.

\$ ..... [1]

27. Nov/2021/Paper_13/No.18

Marek buys a computer for $420.
He sells it at a loss of 15%.

Calculate the selling price of this computer.

$ ..... [2]

28. Nov/2021/Paper_13/No.20

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

$$\frac{4.3 \times 30.7}{6.6 - 1.8}.$$

..... [2]

29. Nov/2021/Paper_13/No.22

Without using a calculator, work out $\frac{11}{12}+\frac{3}{4}$.

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

..... [3]

30. Nov/2021/Paper_21/No.1

P is a prime number where $60 < P < 80$.
P is 2 less than a square number.

Find the value of P.

$P =$ ..... [2]

31. Nov/2021/Paper_21/No.2

Hank flies from Los Angeles to Shanghai.

(a) The flight departs on Friday 22 July at 21 40.
The flight takes 13 hours 35 minutes.
The local time in Shanghai is 15 hours ahead of the local time in Los Angeles.

Find the day, date and time in Shanghai when Hank's flight arrives.

Day ....., Date ....., Time ..... [3]

(b) The cost of the flight is $920.
The exchange rate is $1 = 6.87 Chinese yuan.

Find the cost of the flight in yuan.

..... yuan [1]

32. Nov/2021/Paper_21/No.3

Calculate.

$$\frac{4.87-2.7}{-0.2+\sqrt[3]{0.729}}$$

..... [1]

33. Nov/2021/Paper_21/No.7

Without using a calculator, work out $1\frac{5}{6}+\frac{2}{5}$.

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

..... [3]

34. Nov/2021/Paper_21/No.12

Chai invests some money.
By the end of the first year, the value of the investment has decreased by 35%.
By the end of the second year, the value of the investment has increased by 40% of its value at the end of the first year.

Find the overall percentage change in the value of the investment.

..... % [3]

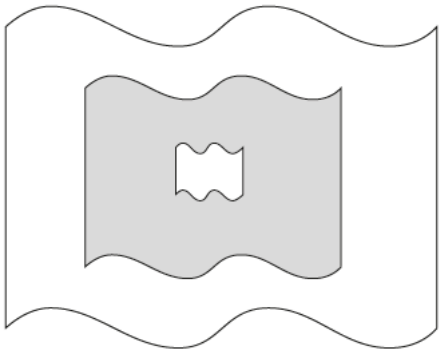
35. Nov/2021/Paper_21/No.14

y is inversely proportional to the square root of $(x-2)$.
When $x = 4.25$, $y = 12$.

Find x when $y = 3$.

$x =$ ..... [3]

36. Nov/2021/Paper_21/No.15



NOT TO SCALE

The diagram shows three shapes that are mathematically similar.
The heights of the shapes are in the ratio small : medium : large = 1 : 5 : 8.

Find the ratio shaded area : total unshaded area.
Give your answer in its simplest form.

..... : ..... [4]

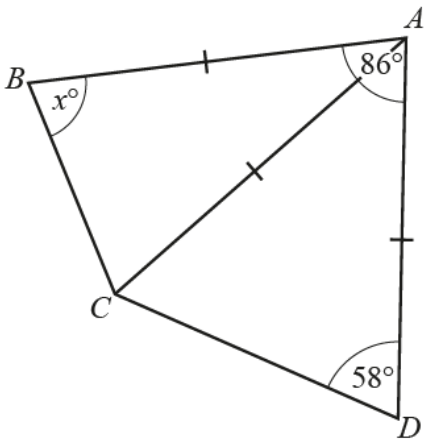
37. Nov/2021/Paper_22/No.1

The temperature at midnight is −8.5 °C.
The temperature at 11 am is −1 °C.

Work out the difference between the temperature at midnight and the temperature at 11 am.

..... °C [1]

38. Nov/2021/Paper_22/No.4



NOT TO SCALE

Triangle ABC and triangle ACD are isosceles.
Angle $DAB = 86°$ and angle $ADC = 58°$.

Find the value of x.

$x =$ ..... [3]

39. Nov/2021/Paper_22/No.5

Angelique rents a room for a party.
The cost of renting the room is $15.50 for the first hour and then $7.25 for each additional hour.
She pays $95.25 in total.

Work out the total number of hours she rents the room for.

..... hours [3]

40. Nov/2021/Paper_22/No.6

Without using a calculator, work out $\frac{1}{3} \div \frac{7}{6} + \frac{1}{5}$.

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

..... [4]

41. Nov/2021/Paper_22/No.8

Calculate $\sqrt[4]{39\frac{1}{16}}$.

..... [1]

42. Nov/2021/Paper_22/No.9

2.1×10^{-1} $0.\dot{2}$ 22% $\sqrt{0.2}$ $\frac{24}{1000}$

Write these values in order of size, starting with the smallest.

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

43. Nov/2021/Paper_22/No.13

(a) Write 243×27^{2n} as a single power of 3 in terms of n.

..... [2]

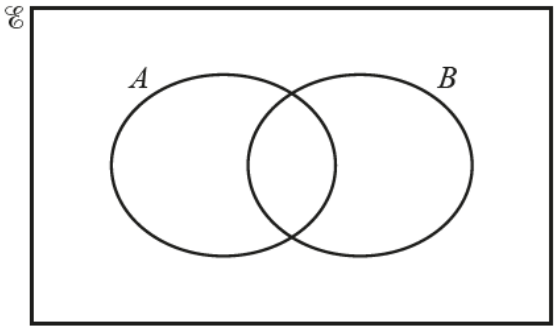
(b) $k = 2 \times 3^2 \times p^3$, where p is a prime number greater than 3.

Write $6k^2$ as a product of prime factors in terms of p.

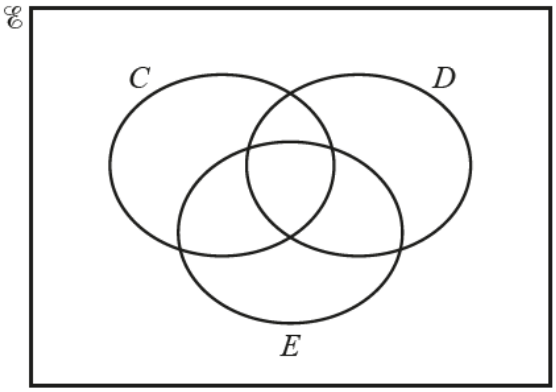
..... [2]

44. Nov/2021/Paper_22/No.19

In these Venn diagrams, shade the given regions.



$A' \cup B'$



$(C \cup D) \cap E'$

[2]

45. Nov/2021/Paper_23/No.1

Write 26 g as a percentage of 208 g.

..... % [1]

46. Nov/2021/Paper_23/No.3

11 13 15 17 19

From this list, write down the number that is both a prime number and a factor of 195.

..... [1]

47. Nov/2021/Paper_23/No.4

(a) $=$ $\neq$ $>$ $<$

Put a ring around each of the symbols that make this statement correct.

0.5 ..... 5% [1]

(b) Insert one pair of brackets to make this statement correct.

$7 - 3 - 1 + 2 = 7$ [1]

48. Nov/2021/Paper_23/No.5

Nina changes 153 euros into dollars when the exchange rate is \$1 = 0.9 euros.

Calculate the amount Nina receives.

\$ ..... [1]

49. Nov/2021/Paper_23/No.6

Marek buys a computer for $420.
He sells it at a loss of 15%.

Calculate the selling price of this computer.

$ ..... [2]

50. Nov/2021/Paper_23/No.8

Beatrice walks 1 km at a speed of 4 km/h and then 2 km at a speed of 4.5 km/h.

Work out Beatrice's average speed for the whole journey.

..... km/h [3]

51. Nov/2021/Paper_23/No.12

Without using a calculator, work out $\frac{11}{12} + \frac{3}{4}$.

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

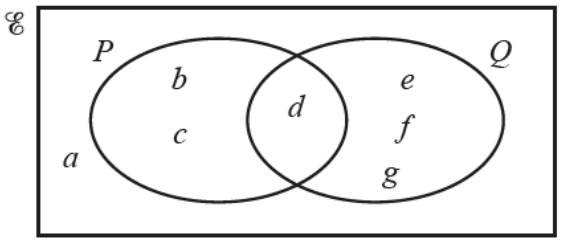
..... [3]

52. Nov/2021/Paper_23/No.13

Calculate $0.04^2 + 0.03 \times 0.28$.
Give your answer in standard form.

..... [2]

53. Nov/2021/Paper_23/No.14



(a) Complete the statement.

$P \cup Q = \{$ ..... $\}$ [1]

(b) Find $n(Q)$.

..... [1]

(c) Find $n(P' \cap Q)$.

..... [1]

54. Nov/2021/Paper_23/No.15

The cost of a train journey is increased by 6% to a new cost of $153.70 .

Calculate the original cost of the train journey.

$ ..... [2]

55. Nov/2021/Paper_23/No.16

Jo and Mo share $26.
Jo receives $5 more than Mo.

Find the ratio Jo's money : Mo's money.
Give your answer in its simplest form.

..... : ..... [3]

56. Nov/2021/Paper_31/No.1

(a) 14 17 25 27 30 36 48

From the list, write down

(i) the square root of 289,

..... [1]

(ii) a factor of 81,

..... [1]

(iii) a common multiple of 3 and 5.

..... [1]

(b) A, B and C are three **consecutive** whole numbers.

- A is a prime number.
- B is a cube number.
- C is a square number.
- A + B + C is less than 40.

Find A, B and C.

A = ...

B = ...

C = ... [2]

(c) Put **one** pair of brackets into each of these calculations to make them correct.

(i) $4 \times 3 + 7 \div 2 = 20$

[1]

(ii) $51 - 12 \div 3 + 6 = 19$

[1]

(d) Write down

(i) the reciprocal of 8,

..... [1]

(ii) the value of 14^0.

..... [1]

(e) Calculate.

(i) 5^4

..... [1]

(ii) $\sqrt[3]{6859}$

..... [1]

(iii) $16^{-\frac{1}{2}}$

..... [1]

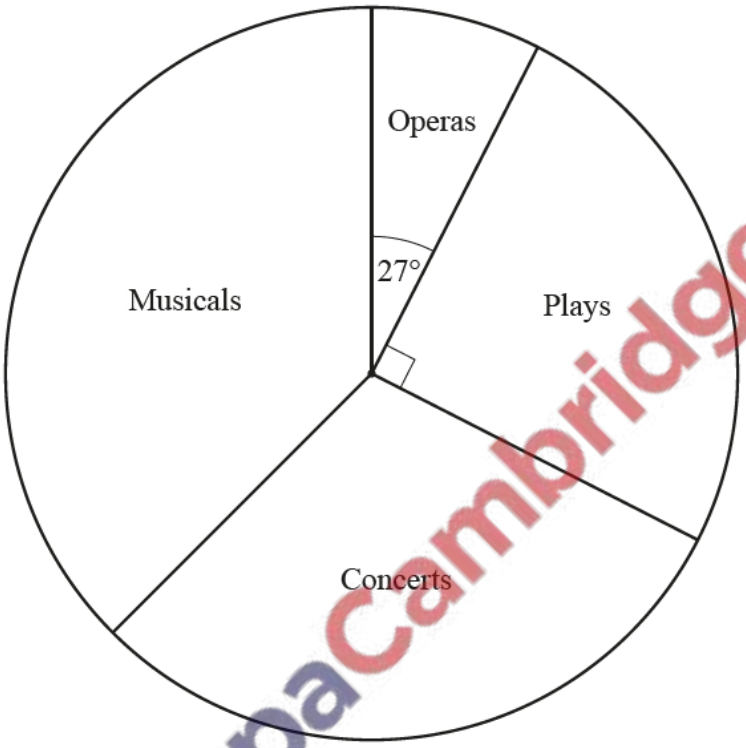
57. Nov/2021/Paper_31/No.2

(a) In one year, a theatre sells four hundred and ninety-six thousand and fifty tickets.

Write this number in figures.

..... [1]

(b) The theatre is used for performances of operas, plays, concerts and musicals.
The pie chart shows information about the number of each type of performance.



(i) Complete these statements.

The type of performance shown the most is ..... .

The sector angle for this type of performance is ..... degrees. [2]

(ii) Write down the percentage of performances that are plays.

..... % [1]

(iii) The theatre is used for 320 performances in the year.

Calculate the number of opera performances.

..... [2]

(iv) The number of concert performances is in the ratio classical music : popular music = 7 : 5.
There are 56 classical music concerts.

Find the number of popular music concerts.

..... [2]

(c) The table shows the prices of a child ticket and a senior ticket for a play.

Adult	Child	Senior
$	$15.50	$35

Alex buys tickets for 2 adults, 3 children and 1 senior.
He pays a total of $159.50 .

Complete the table.

[2]

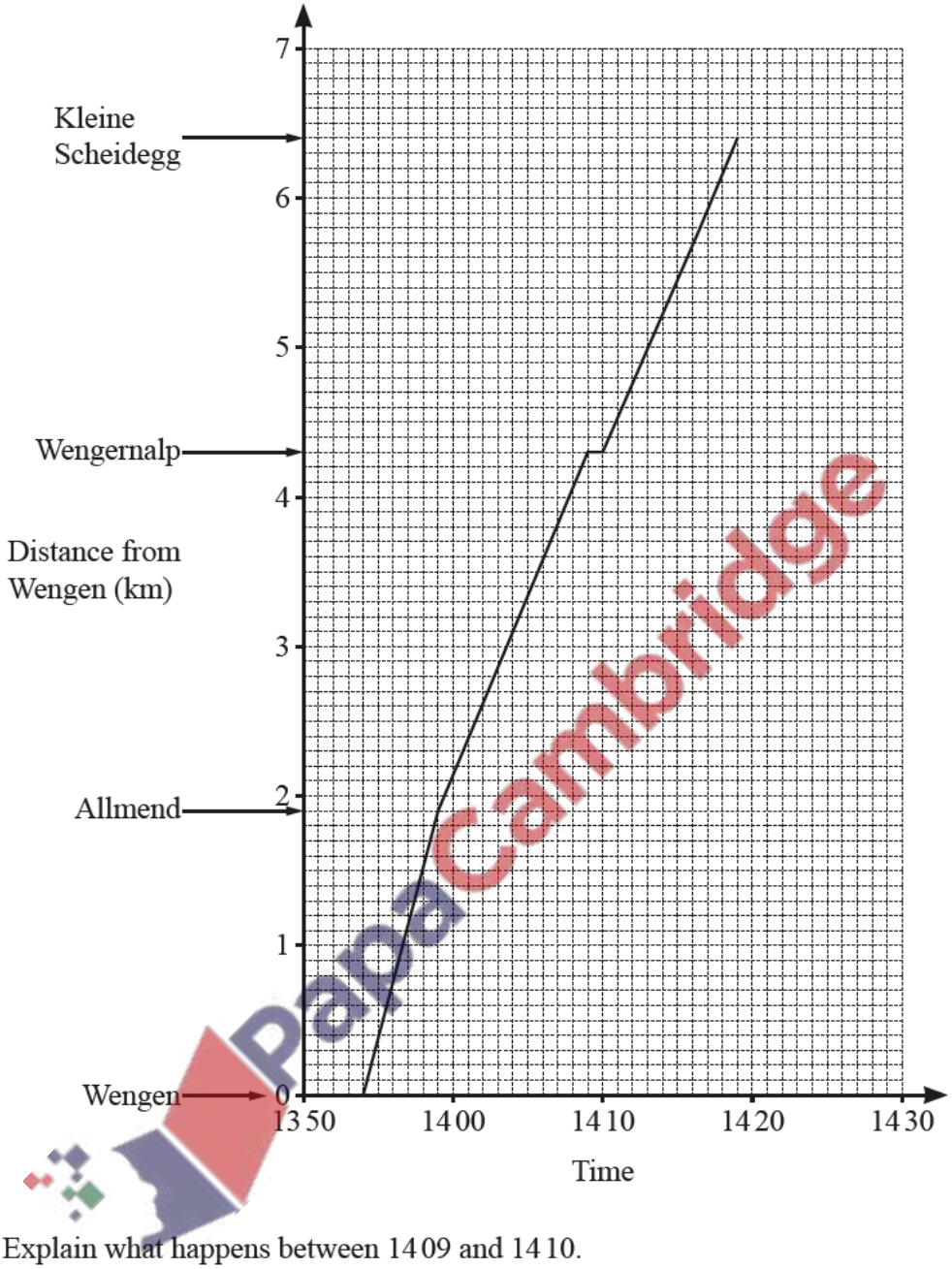
(d) Last week the cost of a ticket for a musical was $65.
This week the same ticket costs $55.90 .

Find the percentage reduction in the cost of this ticket.

..... % [2]

58. Nov/2021/Paper_31/No.6

(a) The diagram shows the travel graph of a train journey from Wengen to Kleine Scheidegg.



(i) Explain what happens between 1409 and 1410.

..... [1]

(ii) Find the journey time from Allmend to Wengernalp in minutes.

..... min [1]

(iii) Calculate the average speed for the train journey from Wengen to Kleine Scheidegg.
Give your answer in km/h.

..... km/h [3]

(iv) Another train travels from Kleine Scheidegg to Wengen.
The table gives information about its journey.

Station	Arrival time	Departure time
Kleine Scheidegg		1401
Wengernalp	Train does not stop	
Allmend	1418	1420
Wengen	1430	

On the travel graph, draw the journey for this train. [3]

(v) Write down the time when the two trains pass each other.

..... [1]

(b) The temperature in Wengen at 5 am was −3 °C.
At 4 pm the temperature has increased by 10 °C.

Work out the temperature at 4 pm.

..... °C [1]

(c) A formula to work out the temperature at different heights above Wengen is

$$T = 2 - \frac{h}{130}$$

where T is the temperature in °C and h is the height, in metres, above Wengen.
Kleine Scheidegg is 780 m above Wengen.

Work out the temperature at Kleine Scheidegg.

..... °C [1]

59. Nov/2021/Paper_32/No.1

(a) In a café at a train station, a cup of coffee costs \$3.25 and a glass of cola costs \$2.15 . Gary buys 2 cups of coffee and 4 glasses of cola.

Work out how much change he receives from a \$20 note.

\$ ..... [3]

(b) Roy spends \$37.80 in the café on food and drink in the ratio food : drink = 7 : 2.

Work out how much he spends on food.

\$ ..... [2]

(c) The price of a \$48 train ticket is increased by 12%.

Find the new price of the ticket.

\$ ..... [2]

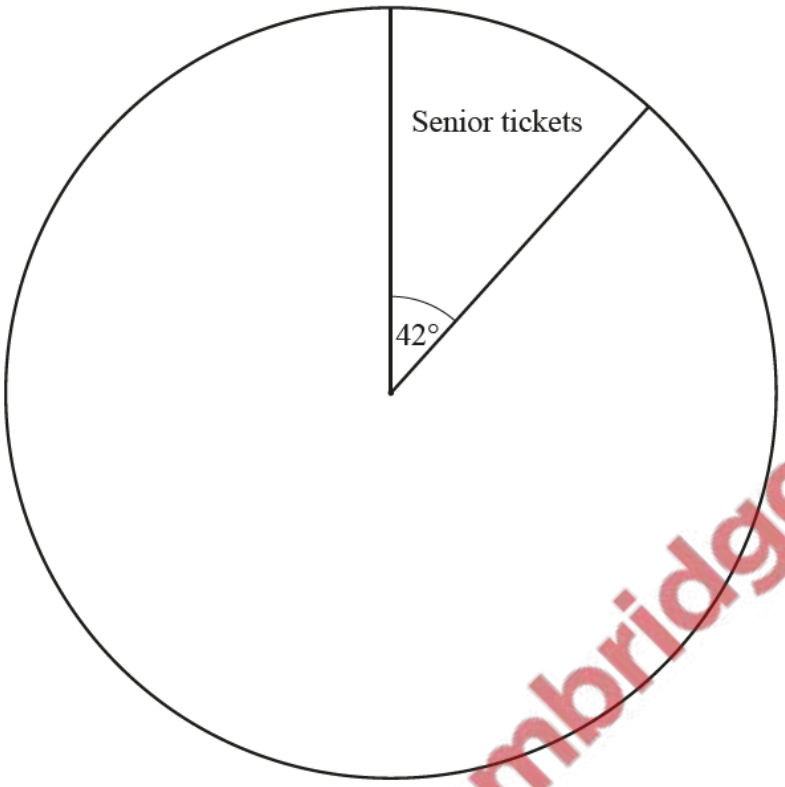
(d) Here is part of the timetable for trains from Washby to Dunstley.
All trains take the same time to travel from Washby to Dunstley.

Washby	09 18	11 05
Dunstley	10 03	.....

Complete the timetable.

[2]

(e) On one day, Washby station sells 28 senior tickets, 192 adult tickets and some child tickets.



Complete the pie chart to show this information.

[3]

60. Nov/2021/Paper_32/No.2

(a) 8 17 26 35 49 51 72

From this list of numbers, write down

(i) a multiple of 24,

..... [1]

(ii) a square number,

..... [1]

(iii) a cube number,

..... [1]

(iv) a prime number.

..... [1]

(b) Write 420 as a product of its prime factors.

..... [2]

(c) Find the lowest common multiple (LCM) of 30 and 84.

..... [2]

(d) By writing each number correct to 1 significant figure, show that an estimate for this calculation is 40.

$$\frac{9.875+18.305}{3.418}+27.837$$

[2]

61. Nov/2021/Paper_32/No.3

(a) Simone completes one lap of a 400 metre running track in 79 seconds.

Work out how long it will take her to run 6 km at the same rate.
Give your answer in minutes and seconds.

..... minutes ..... seconds [4]

(b) The probability that she does not win a race is 0.94 .

Find the probability that she wins a race.

..... [1]

(c) Each day she records the number of laps she runs.
Here is her record for one week.

15 42 28 16 24 15 32

(i) Write down the mode.

..... [1]

(ii) Find the median.

..... [2]

(iii) Find the range.

..... [1]

(d) Wilfred records his times, in seconds, for each of 5 laps.

59 74 69 63 65

After running a 6th lap his mean time is 67 seconds.

Find his time for the 6th lap.

..... seconds [3]

62. Nov/2021/Paper_32/No.6

(a) Write these in order, starting with the smallest.

$$0.5806 \qquad \frac{11}{19} \qquad \frac{17}{29} \qquad 58\%$$

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

smallest

(b) Write 0.004 973 correct to

(i) 3 decimal places,

..... [1]

(ii) 2 significant figures.

..... [1]

(c) The height of a flag pole, h metres, is measured as 37.84 metres, correct to 2 decimal places.

Complete this statement about the value of h.

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

(d) The population of Nigeria is 201 000 000, correct to 3 significant figures.

Write this population in standard form.

..... [1]

(e) The table shows the populations of some countries given in standard form, correct to 3 significant figures.

Country	Population
Brazil	2.12×10^8
China	1.42×10^9
Eritrea	5.31×10^6
France	6.55×10^7
Maldives	4.52×10^5
New Zealand	4.79×10^6

Use the information in this table to find

(i) the country with the smallest population,

..... [1]

(ii) the country with the population that is nearest to 5 million,

..... [1]

(iii) the difference between the population of Brazil and the population of France,

..... [1]

(iv) the value of k, correct to 2 significant figures, where

the population of China $= k \times$ the population of Eritrea.

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

63. Nov/2021/Paper_33/No.1

Roberto and his family fly from London to Los Angeles on a holiday.

(a) The flight takes 11 hours 15 minutes.

(i) The flight leaves London at 1540 local time.
The local time in Los Angeles is 8 hours behind the local time in London.

Work out the local time in Los Angeles that the plane arrives.

..... [2]

(ii) The plane flies a total of 8760 km.

Calculate the average speed of the plane.

..... km/h [3]

(b) Roberto hires a car.

(i) The cost of hiring a car is \$56 per day, plus a fixed cost of \$436.

Write down a formula for the cost, C dollars, of hiring a car for d days.

..... [2]

(ii) Roberto is given a car at random.
There are four colours of car.

Colour	Red	Silver	Black	White
Probability	0.17	0.24		0.3

Complete the table. [2]

(c) The family visit a national park which has an area of 4986 km^2.

(i) Write 4986 correct to the nearest hundred.

..... [1]

(ii) Write 4986 in standard form.

..... [1]

(d) A ticket for the park costs \$17.50 plus 8% tax.

Calculate the amount of tax paid.

\$ ..... [1]

(e) The scale drawing shows the positions of two viewing points, *A* and *B*, in the park.
The scale is 1 centimetre represents 5 kilometres.

Scale : 1 cm to 5 km

(i) Work out the actual distance between point *A* and point *B*.

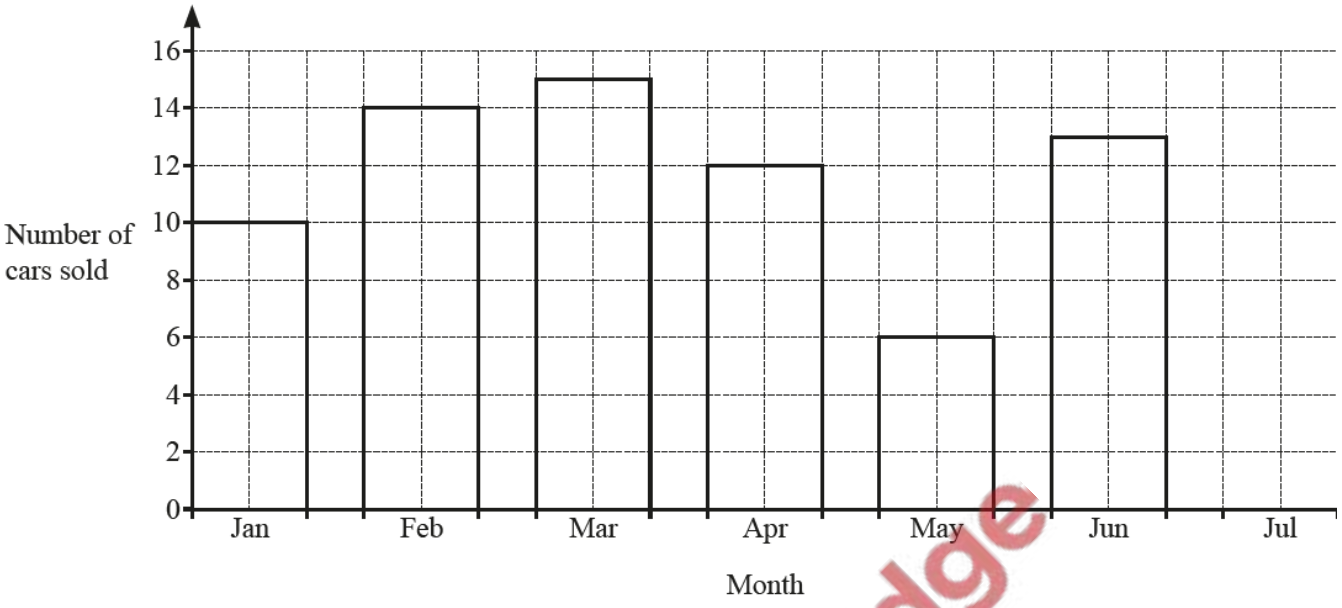
..... km [2]

(ii) Point *C* is 20 km from point *A* on a bearing of 072°.

On the scale drawing mark the position of point *C*. [2]

64. Nov/2021/Paper_33/No.2

(a) The bar chart shows the number of cars sold by a garage in each of six months.



(i) In July, 11 cars were sold.

Complete the bar chart. [1]

(ii) How many more cars were sold in March than in May?

..... [1]

(b) These are the opening times of the garage.

Monday to Friday	8.30 am to 5.30 pm
Saturday	8.30 am to 1.00 pm
Sunday	Closed

Work out how many hours the garage is open in one week.

..... h [2]

(c) Mohammed works at the garage.
He works for 36 hours from Monday to Friday and for 2 hours on Saturday.

He is paid \$10.50 per hour from Monday to Friday.
On Saturday he is paid $1\frac{1}{2}$ times this rate.

Calculate how much Mohammed is paid for this week.

\$ ..... [3]

(d) Viktor is saving to buy a car.
He invests \$8000 for 5 years at a rate of 2.4% per year compound interest.

Calculate the value of Viktor's investment at the end of the 5 years.
Give your answer correct to the nearest dollar.

\$ ..... [3]

(e) At the garage, Pierre, Luigi and Freda sell cars.
They share a bonus of \$12 000 in the ratio Pierre : Luigi : Freda = 8 : 4 : 3.

Calculate the amount they each receive.

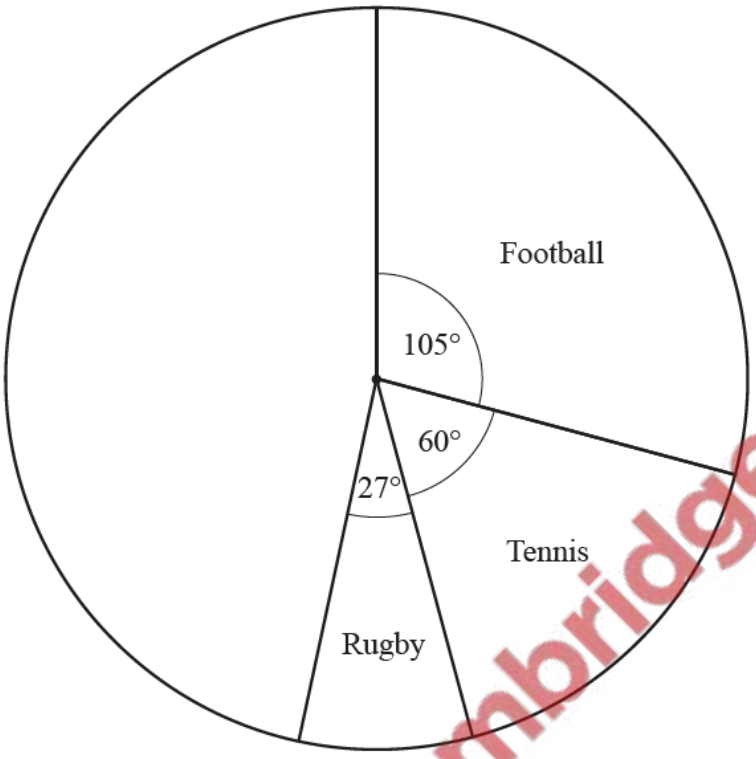
Pierre \$ .....

Luigi \$ .....

Freda \$ ..... [3]

65. Nov/2021/Paper_33/No.6

(a) Jean asks 600 people to choose their favourite sport.
The pie chart shows some of this information.



(i) Show that 100 people choose tennis.

[1]

(ii) Work out how many people choose rugby.

..... [2]

(iii) 125 people choose cricket and the rest choose swimming.

Complete the pie chart to show this information.

[2]

(iv) One of the 600 people is picked at random.

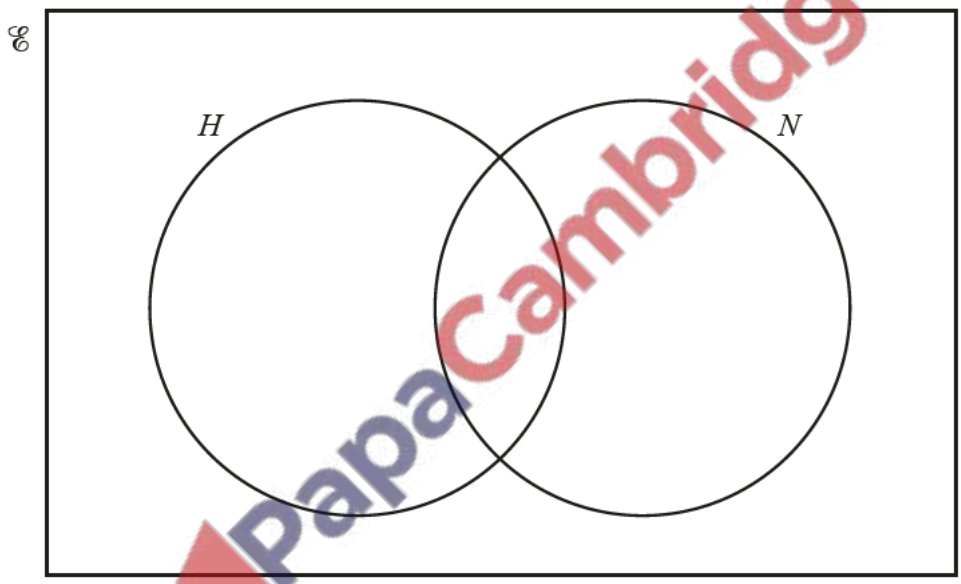
Find the probability that this person chooses tennis or cricket.
Give your answer as a fraction in its simplest form.

..... [2]

(b) There are 80 people in a group.

H = {people who play hockey}
N = {people who play netball}

36 people play hockey.
53 people play netball.
8 people do not play hockey or netball.



Complete the Venn diagram. [3]

66. Nov/2021/Paper_33/No.7

(a) Write the number six hundred and three thousand eight hundred and twenty-one in figures.

..... [1]

(b) Pens cost 47 cents each.
Aroha buys 8 pens.

How much change does she receive from $5?

$ ..... [2]

(c) Find the value of

(i) $\sqrt{81}$,

..... [1]

(ii) 6^3,

..... [1]

(iii) 3^0.

..... [1]

(d) Write 130 as a product of its prime factors.

..... [2]

(e) A tower has two bells, A and B.
Bell A rings every 12 minutes.
Bell B rings every 14 minutes.
Both bells ring at 09 30.

Find the next time both bells ring together.

..... [3]

67. Nov/2021/Paper_41/No.1b,1c

(b) 9000 bricks are needed to build a house.
200 bricks cost $175.

Work out the cost of the bricks needed to build 5 houses.

$ ..... [3]

(c) Saskia builds a wall using 1500 bricks.
She can build at the rate of 40 bricks each hour.
She works for 9 hours each day.
Saskia starts work on 6 July and works every day until the wall is completed.

Find the date when she completes the wall.

..... [3]

68. Nov/2021/Paper_41/No.2

Bob, Chao and Mei take part in a run for charity.

(a) Their times to complete the run are in the ratio Bob : Chao : Mei = 4 : 5 : 7.

(i) Find Chao's time as a percentage of Mei's time.

..... % [1]

(ii) Bob's time for the run is 55 minutes 40 seconds.

Find Mei's time for the run.
Give your answer in minutes and seconds.

..... min ..... s [3]

(b) Chao collects $47.50 for charity.

(i) Bob collects 28% more than Chao.

Find the amount Bob collects.

$ ..... [2]

(ii) Chao collects 60% less than Mei.

Find how much more money Mei collects than Chao.

$ ..... [3]

(c) When running, Chao has a stride length of 70 cm, correct to the nearest 5 cm.
Chao runs a distance of 11.2 km, correct to the nearest 0.1 km.

Work out the minimum number of strides that Chao could take to complete this distance.

..... [4]

(d) In 2015, a charity raised a total of $1.6 million.
After 2015, this amount increased exponentially by 2.4% each year for the next 5 years.

Work out the amount raised by the charity in 2020.

$ ..... million [2]

69. Nov/2021/Paper_42/No.1

(a) Malena has 450 fruit trees.
The fruit trees are in the ratio apple : pear : plum = 8 : 7 : 3.

(i) Show that Malena has 200 apple trees.

[2]

(ii) Find the number of plum trees.

..... [1]

(iii) Malena wants to increase the number of pear trees by 32%.

Calculate the number of extra pear trees she needs.

..... [2]

(iv) Each apple tree produces 48.5 kg of apples.
The apples have an average mass of 165 g each.

Calculate the total number of apples produced by the 200 trees.
Give your answer correct to the nearest 1000 apples.

..... [3]

(b) Malena's land is valued at three million and seventy-five thousand dollars.

(i) Write this number in figures.

..... [1]

(ii) Write your answer to **part (b)(i)** in standard form.

..... [1]

(c) In 2020, each plum tree produced 37.7 kg of plums.
This was 16% more than in 2019.

Calculate the mass of plums produced by each plum tree in 2019.

..... kg [2]

(d) Malena invests $1800 at a rate of 2.1% per year compound interest.

Calculate the value of her investment at the end of 15 years.

$ ..... [2]

70. Nov/2021/Paper_42/No.8

(a) Kaito runs along a 12 km path at an average speed of x km/h.

(i) Write down an expression, in terms of x, for the number of hours he takes.

..... hours [1]

(ii) Yuki takes 1.5 hours longer to walk along the same path as Kaito.
She walks at an average speed of $(x-4)$ km/h.

Write down an equation, in terms of x, and show that it simplifies to $x^2-4x-32=0$.

[4]

(iii) Solve by factorisation.

$x^2-4x-32=0$

$x =$ ..... or $x =$ ..... [3]

(iv) Find the number of hours it takes Yuki to walk along the 12 km path.

..... hours [2]

(b) A bus travels 440 km, correct to the nearest 10 km.
The time taken to complete the journey is 6 hours, correct to the nearest half hour.

Calculate the lower bound of the speed of the bus.

..... km/h [3]

71. Nov/2021/Paper_43/No.5

(a) $500 is invested at a rate of 3% per year.

Calculate the total interest earned at the end of 7 years when

(i) simple interest is paid,

$ ..... [2]

(ii) compound interest is paid.

$ ..... [3]

(b) The value of a car decreases exponentially by 10% each year.
The value now is $6269.40 .

Calculate the value of the car 3 years ago.

$ ..... [3]

72. Nov/2021/Paper_43/No.7

(a) Amir buys 3 cakes that cost c cents each and 2 loaves of bread that cost $(2c - 11)$ cents each.
He spends a total of \$5.87 .

Find the value of c.

$c =$ ..... [3]

(b) A bottle of water costs \$$w$.
A bottle of juice costs \$$(w + 1)$.

Alex spends \$22 on bottles of water and \$42 on bottles of juice.
The number of bottles of water is equal to the number of bottles of juice.

Find the value of w.

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

(c) Alicia walks a distance of 9 km at a speed of x km/h.
She then runs a distance of 5 km at a speed of $(2x + 1)$ km/h.

The total time Alicia takes is 2.5 hours.

(i) Show that $10x^2 - 41x - 18 = 0$.

[4]

(ii) Work out Alicia's running speed.
You must show all your working.

..... km/h [4]

73. March/2021/Paper_12/No.3

Calculate the value of $\sqrt{7.29}$.

..... [1]

74. March/2021/Paper_12/No.4

Write down a multiple of 9 between 100 and 110.

..... [1]

75. March/2021/Paper_12/No.5

(a) Tanvi rounds the number 4896.
She writes down 4900.
Rahul says Tanvi rounded 4896 correct to the nearest 100.

Explain why Rahul cannot be certain that Tanvi rounded 4896 correct to the nearest 100.

.....

..... [1]

(b) Calculate.

$$\frac{6.4 \times 4^2}{17.9 - 6.1}$$

Give your answer correct to 3 decimal places.

..... [2]

76. March/2021/Paper_12/No.8

Sahil and Anika share $78 in the ratio 5 : 8.

Calculate the amount each receives.

Sahil $ .....

Anika $ ..... [2]

77. March/2021/Paper_12/No.13

Saanvi makes some biscuits.

She sells $\frac{5}{13}$ of the biscuits.

She now has 96 biscuits left.

Work out the total number of biscuits Saanvi makes.

..... [3]

78. March/2021/Paper_12/No.15

Find the lowest common multiple (LCM) of 18 and 21.

..... [2]

79. March/2021/Paper_12/No.16

(a) Write 567 000 000 in standard form.

..... [1]

(b) 6.5×10^{-2} 6.1×10^{-1} 6.2×10^{2} 6.79×10^{1} 6.18×10^{2} 6.35×10^{-2}

Calculate the product of the largest number and the smallest number from this list.
Give your answer in standard form.

..... [2]

80. March/2021/Paper_12/No.19

Without using a calculator, work out $2\frac{1}{4} \times 3\frac{2}{3}$.

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

..... [3]

81. March/2021/Paper_22/No.2

Sahil and Anika share $78 in the ratio 5 : 8.

Calculate the amount each receives.

Sahil $ .....

Anika $ ..... [2]

82. March/2021/Paper_22/No.4

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

$$\frac{2.8 \times 82.6}{27.8 - 13.9}.$$

..... [2]

83. March/2021/Paper_22/No.5

The number of bowls of hot soup sold decreases when the temperature rises.

What type of correlation does this statement describe?

..... [1]

84. March/2021/Paper_22/No.6

Joseph spends $\frac{5}{24}$ of one week's earnings to buy a jacket.
The cost of the jacket is \$56.50 .

Calculate the amount Joseph earns in a week.

\$ ..... [2]

85. March/2021/Paper_22/No.7

Without using a calculator, work out $2\frac{1}{4} \times 3\frac{2}{3}$.

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

..... [3]

86. March/2021/Paper_22/No.8

Write $0.\dot{3}\dot{7}$ as a fraction.

..... [1]

87. March/2021/Paper_22/No.9

Calculate $4.8 \times 10^6 + 3.7 \times 10^7$.
Give your answer in standard form.

..... [1]

88. March/2021/Paper_22/No.11

Find the highest common factor (HCF) of 36 and 84.

..... [2]

89. March/2021/Paper_22/No.13

The population of one variety of butterfly is decreasing exponentially at a rate of 34% per year.
At the end of 2014, the population was 125.9 million.

Calculate the population at the end of 2019.

..... million [2]

90. March/2021/Paper_22/No.22

(a) A bag of rice has a mass of 25 kg, correct to the nearest kilogram.

Calculate the lower bound of the total mass of 10 of these bags.

..... kg [1]

(b) Virat has 200 metres of wire, correct to the nearest metre.
He cuts the wire into n pieces of length 3 metres, correct to the nearest 20 centimetres.

Calculate the largest possible value of n.

$n =$ ..... [3]

91. March/2021/Paper_32/No.2

A family go on a skiing holiday to America.

(a) The hotel has 840 rooms.
735 rooms are occupied.

Calculate the percentage of rooms that are occupied.

..... % [1]

(b) The temperature in the hotel is 21 °C.
The temperature in the hotel is 26.7 °C warmer than at the top of the mountain.
The temperature at the top of the mountain is 3.2 °C colder than at the bottom of the mountain.

Work out the temperature at the bottom of the mountain.

..... °C [2]

(c)

	Equipment	Hire cost ($)		
		3 days	4 days	7 days
Adult	Ski equipment	80.80	94.60	128.00
	Snowboard equipment	96.80	112.60	151.20
	Helmet	12.80	15.20	20.70
Child	Ski equipment	47.60	55.40	75.80
	Snowboard equipment	59.00	70.20	94.60
	Helmet	10.40	12.00	16.70

There are two adults and one child in the family.
They hire all their equipment.

The child skis for 3 days and snowboards for 4 days.
Both adults ski for 7 days.
All three of them hire a helmet for 7 days.

Work out the total cost of the equipment hire for the family.

$ ..... [2]

(d) A ski lift, when full, takes 4000 passengers per hour.
This lift works for 10 hours a day.
One day, this lift is 90% full for 3 hours and 75% full for 7 hours.

Work out the number of passengers who take the lift that day.

..... [3]

(e) The family buy their lift passes before the holiday for a total of 51 400 rupees.
In America, the passes cost a total of \$684.
The exchange rate is 1 rupee = \$0.0129 .

Show that the family save 1620 rupees, correct to the nearest 10 rupees, by buying the passes before their holiday.

[3]

(f) The height, h metres, of the mountain is 2642 m, correct to the nearest metre.

Complete this statement about the value of h.

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

92. March/2021/Paper_32/No.4c

(c) **(i)** Kendra and Latika leave Latika's house at 1500 to go to the cinema.

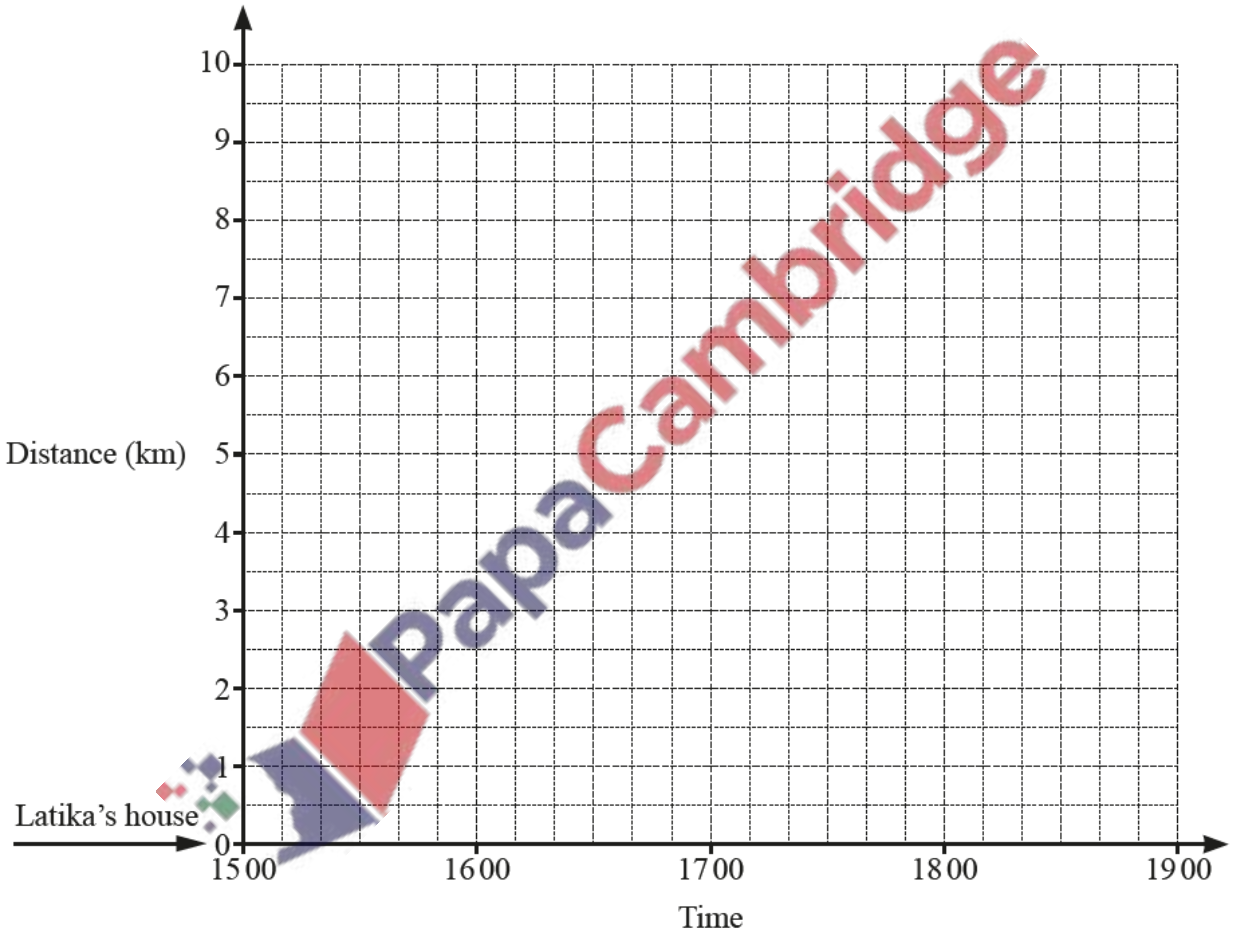
(a) They walk for 20 minutes at a constant speed of 4.5 km/h.

Work out the distance they walk.

..... km [1]

(b) After walking for 20 minutes, they then run a distance of 6 km at a constant speed for 40 minutes.

Draw their journey to the cinema on the travel graph.



[2]

(ii) Kendra and Latika leave the cinema at 1805.
They travel back to Latika's house in a taxi at a constant speed of 30 km/h.

Complete the travel graph.

[2]

93. March/2021/Paper_32/No.7

Prakash buys 45 flowers from a shop.

(a)

Special offer
Buy 3 bunches of flowers for the price of 2 bunches.

Each bunch has 5 flowers.
The price of one bunch of flowers is $2.68 .

Using the special offer, work out how much Prakash pays for the 45 flowers.

$ ..... [3]

(b) 15 of the flowers are red.
18 of the flowers are orange.
The rest of the flowers are yellow.

Write down the ratio of the number of red flowers : orange flowers : yellow flowers.
Give your answer in its simplest form.

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

(c) Prakash gives the 45 flowers to his family.

He gives his grandmother x flowers.
He gives his mother 8 more flowers than his grandmother.
He gives his cousin 6 fewer flowers than his grandmother.
He gives his sister twice as many flowers as he gives his cousin.

(i) Use this information to show that $5x - 10 = 45$.

[3]

(ii) Solve the equation $5x - 10 = 45$.

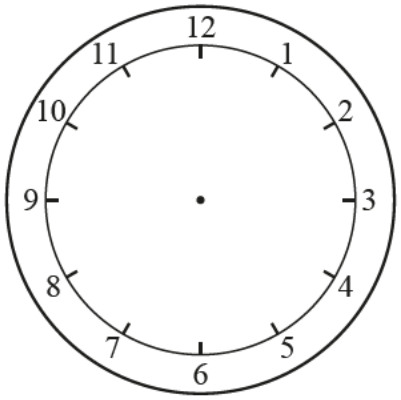
$x =$ ..... [2]

(iii) Find the number of flowers that Prakash gives to his cousin.

..... [1]

94. March/2021/Paper_32/No.8

(a) A baker puts some cakes in the oven at 5.50 pm.
The cakes take 20 minutes to bake.



Complete the clock diagram to show the time when the cakes are baked. [1]

(b) A recipe uses 550 g of flour to make 8 cakes.

Work out the amount of flour needed to make 360 cakes.
Give your answer in kilograms.

..... kg [3]

(c)

NOT TO SCALE

Work out which bag of flour is the best value.
Show all your working.

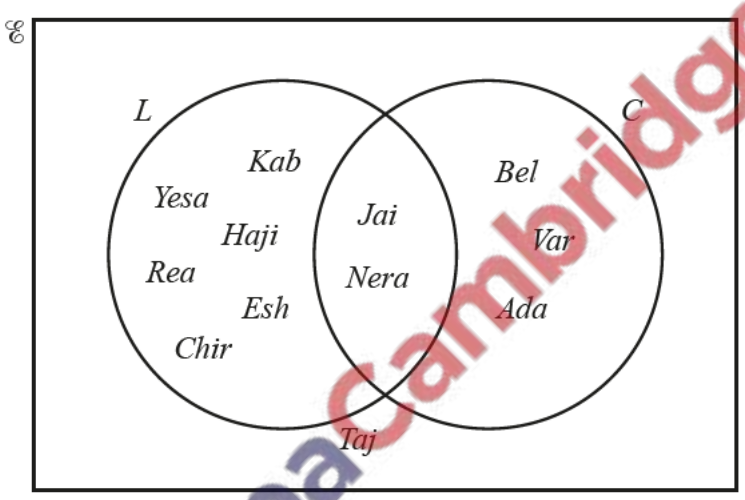
Bag ..... [3]

(d) One cake costs 24 cents to make.
The baker sells each cake for 65 cents.

Calculate the percentage profit the baker makes on each cake.

.....% [2]

(e) The baker asks some customers if they like lemon cake (L) and if they like chocolate cake (C).
The Venn diagram shows the results.



(i) Complete the statement.

$n(\mathscr{E})$ = ... [1]

(ii) Work out the fraction of the customers who like lemon cake or chocolate cake but not both.

..... [1]

(iii) Use set notation to complete the statement.

{*Jai, Nera*} = ... [1]

(iv) What does the Venn diagram show about Taj?

..... [1]

95. March/2021/Paper_42/No.1

Painter	Plumber	Electrician
$35 per hour	Fixed charge $40 plus $26.50 per hour	$48 per hour for the first 2 hours then $32 per hour

These are the rates charged by a painter, a plumber and an electrician who do some work for Mr Sharma.

(a) The painter works for 7 hours.

Calculate the amount Mr Sharma pays the painter.

$ ..... [1]

(b) Mr Sharma pays the plumber $252.

Calculate how many hours the plumber works.

..... hours [2]

(c) Mr Sharma pays the electrician $224.

Calculate how many hours the electrician works.

..... hours [2]

(d) Write down the ratio of the amount Mr Sharma pays to the painter, the plumber and the electrician. Give your answer in its lowest terms.

painter : plumber : electrician = ... : ..... : ..... [2]

96. March/2021/Paper_42/No.10

(a) A box is a cuboid with length 45 cm, width 30 cm and height 42 cm.
The box is completely filled with 90.72 kg of sand.

Calculate the density of this sand in kg/m^3.
[Density = mass ÷ volume]

..... kg/m^3 [3]

(b) A bag contains 15000 cm^3 of sand.
Some of this sand is used to completely fill a hole in the shape of a cylinder.
The hole is 30 cm deep and has radius 10 cm.

Calculate the percentage of the sand from the bag that is used.

..... % [3]

(c) Sand costs $98.90 per tonne.
This cost includes a tax of 15%.

Calculate the amount of tax paid per tonne of sand.

$ ..... [3]

(d) Raj buys some sand for 3540 rupees.

Calculate the cost in dollars when the exchange rate is $1 = 70.8 rupees.

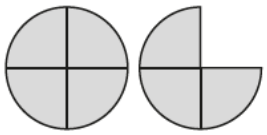
$ ..... [2]

97. June/2021/Paper_11/No.1

Zachary asks the 30 students in his class which is their favourite sport.
The table shows the results.

Netball	Football	Hockey	Tennis
7	12	6	5

Complete the pictogram.

Netball	
Football	
Hockey	
Tennis	

Key:  represents 4 people

[2]

98. June/2021/Paper_11/No.2

(a) Find the value of $\sqrt{225}$.

..... [1]

(b) Write down the reciprocal of $\frac{2}{3}$.

..... [1]

(c) Work out three-quarters of one-third.

..... [1]

(d) Work out $-7-(6-8)$.

..... [1]

99. June/2021/Paper_11/No.8

Nazaneen changes $6500 into 5798 euros at a bank.

Work out the exchange rate the bank uses.

$1 = ... euros [1]

100. June/2021/Paper_11/No.15

The length, l metres, of a piece of rope is 5.67 m, correct to the nearest centimetre.

Complete this statement about the value of l.

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

101. June/2021/Paper_11/No.16

Without using a calculator, work out $1\frac{3}{8} - \frac{5}{6}$.

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

..... [3]

102. June/2021/Paper_11/No.17

(a) Write $\frac{1}{2\times2\times2\times2\times2}$ as a power of 2.

..... [1]

(b) **(i)** $3^{18} \div 3^{t} = 3^{6}$

Find the value of t.

$t =$ ..... [1]

(ii) Simplify.

$8w^{10} \times 6w^{5}$

..... [2]

103. June/2021/Paper_11/No.18

Annie invests $8300 at a rate of 5.6% per year compound interest.

Calculate the value of her investment at the end of 6 years.

$ ..... [2]

104. June/2021/Paper_11/No.19

Write down an irrational number, n, where $31 < n < 32$.

$n =$ ..... [1]

105. June/2021/Paper_11/No.20

By rounding each number in the calculation correct to 1 significant figure, estimate the value of

$$\frac{38.7 \times 3.115}{20.3 - 4.1^2}.$$

You must show all your working.

..... [2]

106. June/2021/Paper_12/No.2

Write down all the factors of 42.

..... [2]

107. June/2021/Paper_12/No.5

The formula for changing a temperature measured in Celsius (°C) to Fahrenheit (°F) is

$$F = \frac{9C}{5} + 32.$$

Use this formula to change 65°C to Fahrenheit.

..... °F [2]

108. June/2021/Paper_12/No.6

(a) **Without using a calculator**, work out $9+5\times7-4\div2$.
You must show all your working.

..... [2]

(b) Insert one pair of brackets into this statement to make it correct.

$$9 + 5 \times 7 - 4 \div 2 = 96$$

[1]

109. June/2021/Paper_12/No.8

Write down the number that you

(a) add to -4 to give an answer of 9,

..... [1]

(b) subtract from -9 to give an answer of -4.

..... [1]

110. June/2021/Paper_12/No.11

Calculate $\sqrt[4]{0.0256}$.

..... [1]

111. June/2021/Paper_12/No.13

(a) Complete these statements.

The reciprocal of 0.2 is .....

A prime number between 90 and 100 is ..... [2]

(b)

$\frac{7}{5}$ 0.6 $\sqrt{7}$ 8 $\sqrt{9}$

From this list, write down an irrational number.

..... [1]

112. June/2021/Paper_12/No.14

Find the value of x when $7^x \div 7^4 = 7^9$.

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

113. June/2021/Paper_12/No.18

Without using a calculator, work out $\frac{2}{3} \div 1\frac{3}{7}$.

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

..... [3]

114. June/2021/Paper_12/No.21

(a) Write 0.006 54 in standard form.

..... [1]

(b) The number 1.467×10^{102} is written as an ordinary number.

Write down the number of zeros that follow the digit 7.

..... [1]

115. June/2021/Paper_12/No.23

Work out the lowest common multiple (LCM) of 24 and 54.

..... [2]

116. June/2021/Paper_13/No.3

Write down the number that is 23 less than -1.6 .

..... [1]

117. June/2021/Paper_13/No.4

Write as a fraction in its simplest form.

(a) 72%

..... [1]

(b) 0.004

..... [1]

118. June/2021/Paper_13/No.9

12 18 29 49 91 125

From the list of numbers, write down

(a) a cube number,

..... [1]

(b) a prime number.

..... [1]

119. June/2021/Paper_13/No.13

Alex changes 190 euros (€) into pounds (£) when £1 = €1.1723 .

Calculate the amount Alex receives.
Give your answer correct to 2 decimal places.

£ ..... [2]

120. June/2021/Paper_13/No.16

Without using a calculator, work out $1\frac{2}{3} \div 7\frac{1}{2}$.

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

..... [3]

121. June/2021/Paper_13/No.19

(a) Write 0.000 74 in standard form.

..... [1]

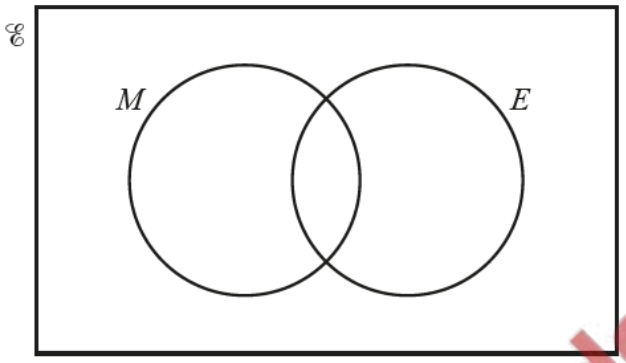
(b) Calculate $4.6 \times 10^2 \times 6.7 \times 10^5$.
Give your answer in standard form, correct to 2 significant figures.

..... [2]

122. June/2021/Paper_13/No.20

(a) A group of 120 students take two tests, mathematics and English.
Here is some information about the number of students who pass mathematics (M) and who pass English (E).

- 61 students pass mathematics.
- 27 students pass both mathematics and English.
- 19 students do not pass mathematics and do not pass English.

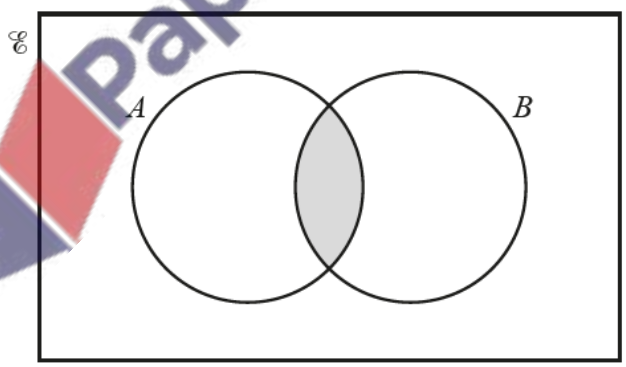


(i) Complete the Venn diagram. [3]

(ii) Use the Venn diagram to find n(E).

..... [1]

(b)



Use set notation to describe the shaded region.

..... [1]

123. June/2021/Paper_13/No.23

Simplify $3x^3 \times 4x^4$.

..... [2]

124. June/2021/Paper_21/No.8

Without using a calculator, work out $1\frac{3}{8} - \frac{5}{6}$.

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

..... [3]

125. June/2021/Paper_21/No.12

The profit a company makes decreases exponentially at a rate of 0.9% per year.
In 2014, the profit was $9500.

Calculate the profit in 2019.

$ ..... [2]

126. June/2021/Paper_21/No.13

On a map, a lake has an area of 32 cm^2.
The scale of the map is 1 : 24 000.

Calculate the actual area of the lake.
Give your answer in km^2.

..... km^2 [2]

127. June/2021/Paper_21/No.14

y is directly proportional to the square root of $(x-3)$.
When $x = 28$, $y = 20$.

Find y when $x = 39$.

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

128. June/2021/Paper_21/No.20

The distance between two towns is 600 km, correct to the nearest 10 km.
A car takes 8 hours 40 minutes, correct to the nearest 10 minutes, to travel this distance.

Calculate the lower bound for the average speed of the car in km/h.

..... km/h [3]

129. June/2021/Paper_22/No.2

Calculate $\sqrt[4]{0.0256}$.

..... [1]

130. June/2021/Paper_22/No.4

Write down an expression for the range of k consecutive integers.

..... [1]

131. June/2021/Paper_22/No.7

(a) Complete these statements.

The reciprocal of 0.2 is .....

A prime number between 90 and 100 is ..... [2]

(b)

$\frac{7}{5}$ 0.6 $\sqrt{7}$ 8 $\sqrt{9}$

From this list, write down an irrational number.

..... [1]

132. June/2021/Paper_22/No.9

Without using a calculator, work out $\frac{2}{3} \div 1\frac{3}{7}$.

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

..... [3]

133. June/2021/Paper_22/No.10

(a) Write 0.006 54 in standard form.

..... [1]

(b) The number 1.467×10^{102} is written as an ordinary number.

Write down the number of zeros that follow the digit 7.

..... [1]

134. June/2021/Paper_22/No.11

Write $0.\dot{0}\dot{4}$ as a fraction in its simplest form.

..... [1]

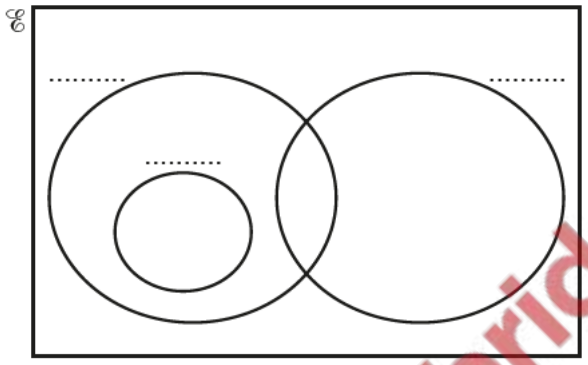
135. June/2021/Paper_22/No.12

(a) $\mathscr{E}$ = {integers greater than 2}
A = {prime numbers}
B = {odd numbers}
C = {square numbers}

(i) Describe the type of numbers in the set $B' \cap C$.

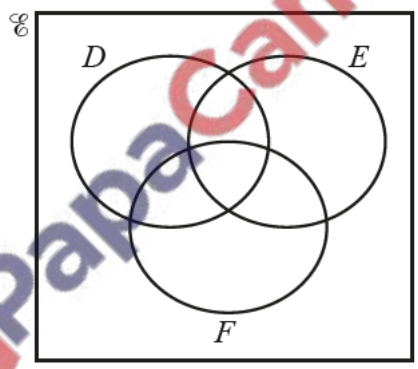
..... [1]

(ii) Complete the set labels on the Venn diagram.



[1]

(b)



Shade the region $D' \cup (E \cap F)'$. [1]

136. June/2021/Paper_22/No.21

The force of attraction, F Newtons, between two magnets is inversely proportional to the square of the distance, d cm, between the magnets.

When $d = 1.5$, $F = 48$.

(a) Find an expression for F in terms of d.

$F =$ ..... [2]

(b) When the distance between the two magnets is doubled the new force is n times the original force.

Work out the value of n.

$n =$ ..... [1]

137. June/2021/Paper_23/No.1

Write down the number that is 23 less than -1.6 .

..... [1]

138. June/2021/Paper_23/No.2

Write as a fraction in its simplest form.

(a) 72%

..... [1]

(b) 0.004

..... [1]

139. June/2021/Paper_23/No.5

Jo invests $600 for 7 years at a rate of 1.5% per year simple interest.

Calculate the total interest earned during the 7 years.

$ ..... [2]

140. June/2021/Paper_23/No.7

12 18 29 49 91 125

From the list of numbers, write down

(a) a cube number,

..... [1]

(b) a prime number.

..... [1]

141. June/2021/Paper_23/No.8

Alex changes 190 euros (€) into pounds (£) when £1 = €1.1723 .

Calculate the amount Alex receives.
Give your answer correct to 2 decimal places.

£ ..... [2]

142. June/2021/Paper_23/No.9

Without using a calculator, work out $1\frac{2}{3} \div 7\frac{1}{2}$.

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

..... [3]

143. June/2021/Paper_23/No.20

Simplify $2.1\times10^{p}+2.1\times10^{p-1}$.
Give your answer in standard form.

..... [2]

144. June/2021/Paper_23/No.22

z is inversely proportional to the square of $(y-2)$.
When $y = 5$, $z = 9$.

Find z in terms of y.

$z =$ ..... [2]

145. June/2021/Paper_31/No.1

(a) Strawberries cost \$4.20 per kilogram and cream costs \$8.56 per litre.
Venus buys 1.2 kg of strawberries and 125 ml of cream.

Work out the total cost.

\$ ..... [3]

(b) Ravi has \$20.
A pineapple costs \$1.45 .

Work out the largest number of pineapples Ravi can buy and the change he receives.

Number of pineapples .....

Change \$ ..... [3]

(c) Abraham has a box of 72 biscuits.
He gives $\frac{2}{9}$ of the biscuits to his grandmother.
He then gives $\frac{3}{7}$ of the biscuits that are left to his cousin.

Work out how many biscuits Abraham has now.

..... [3]

146. June/2021/Paper_31/No.3b

(b) A railway track, 36 km long, is to be built in a straight line from R to M.

(i) The track costs \$1070 per metre to build.

Work out the cost of building the track.

\$ ..... [2]

(ii) 15 people can build 60 metres of track per day.

Work out how many days it will take 45 people to build the whole track.

..... days [3]

147. June/2021/Paper_31/No.7

(a) Martin, Suki and Pierre make clocks.
In one week

- Martin makes x clocks.
- Suki makes 3 fewer clocks than Martin.
- Pierre makes twice as many clocks as Suki.

(i) Write an expression for the total number of clocks they make in one week.
Give your expression in its simplest form.

..... [3]

(ii) The total number of clocks they make in one week is 35.

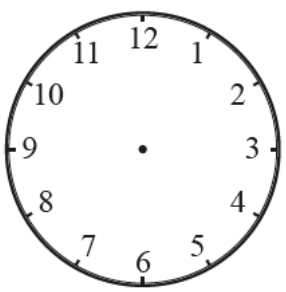
(a) Work out the value of x.

$x =$ ..... [3]

(b) Work out how many more clocks Pierre makes than Martin.

..... [2]

(b)



(i) Complete the clock diagram to show the time 2.30 pm. [1]

(ii) Calculate the obtuse angle between the hands of the clock at 2.30 pm.

..... [2]

(c) Work out the number of seconds in 10 days.
Give your answer in standard form.

..... seconds [2]

(d) A clock is started at 15 00.
The clock is not working correctly and is slow.
The clock loses 8 minutes every hour so after one hour the clock shows 15 52.

What time will the clock show $3\frac{1}{2}$ hours after it is started?

..... [2]

(e) The times on two clocks are checked regularly.

One clock is checked every 6 days.
The other clock is checked every 8 days.

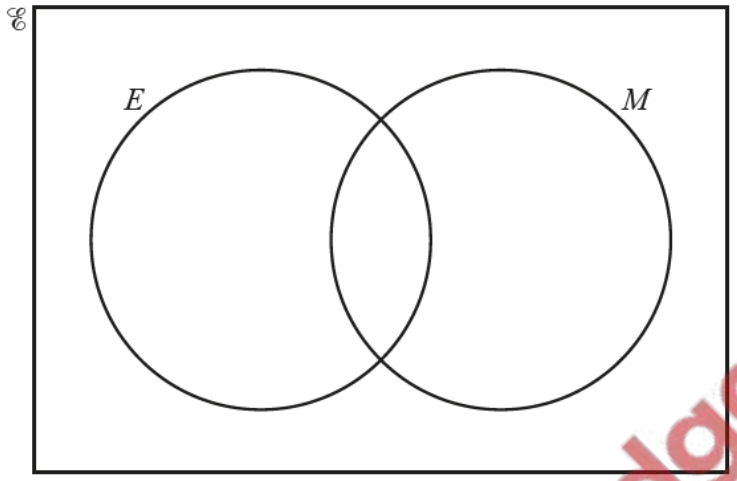
Both clocks are checked on 1st January 2021.

Find the number of days during 2021 when both clocks will be checked on the same day.
[There are 365 days in 2021.]

..... [4]

148. June/2021/Paper_31/No.9

(a) $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
$E = \{x: x \text{ is an even number}\}$
$M = \{x: x \text{ is a multiple of } 3\}$



(i) Complete the Venn diagram. [2]

(ii) Write down $n(E \cup M)$.

..... [1]

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

Write down the probability that the number is in the set $E \cap M$.

..... [2]

(b) Meg says that an even number cannot be a prime number.

Is she correct?
Give a reason for your answer.

..... because ..... [1]

149. June/2021/Paper_32/No.1

Alex is building a house.

The materials cost $1\frac{1}{2}$ times the cost of the land.

The wages cost $1\frac{1}{4}$ times the cost of the land.

(a) Show that the ratio of costs, in its simplest form, is land : materials : wages = 4 : 6 : 5.

[2]

(b) The wages cost \$47 500.

Show that the total cost of land, materials and wages is \$142 500.

[2]

(c) Work out the cost of

(i) the land.

\$ ..... [2]

(ii) the materials.

$ ..... [1]

(d) Alex borrows $28 000 for 6 years at a rate of 5.5% per year compound interest.

Calculate the amount he repays at the end of the 6 years.
Give your answer correct to the nearest dollar.

$ ..... [3]

(e) When Alex sells the house, he makes a profit of 27% on the $142 500.

Calculate the selling price of the house.

$ ..... [2]

150. June/2021/Paper_32/No.3

Pierre travels from his home in Lyon to Singapore.

(a) He travels by train from Lyon to Paris.
The train leaves Lyon at 9.05 am and arrives in Paris at 1.30 pm.

(i) Write 1.30 pm in the 24-hour clock system.

..... [1]

(ii) Work out, in hours and minutes, the time the train journey takes.

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

(b) He then travels by plane from Paris to Singapore.
The plane leaves Paris at 1635 on Thursday and arrives in Singapore 13 hours and 45 minutes later.
The local time in Singapore is 6 hours ahead of the local time in Paris.

Work out the day and time in Singapore when the plane arrives.

Day ..... Time ..... [3]

(c) The distance from Paris to Singapore is 10 736 kilometres.

Work out the average speed of the plane.

..... km/h [2]

(d) Pierre buys a watch for 400 Singapore dollars.
The exchange rate is 1 Singapore dollar = 0.658 euros.

Work out the cost of the watch in euros.

..... euros [1]

(e) Pierre stays at a hotel in Singapore for 5 nights.
The cost per night of the room is $170.
His total hotel bill is $975.40 .

Calculate how much Pierre spends on other hotel items.

$ ..... [2]

151. June/2021/Paper_32/No.4

(a) Put a ring around the fraction that is equivalent to $\frac{7}{12}$.

$\frac{35}{62}$ $\frac{20}{36}$ $\frac{49}{84}$ $\frac{82}{144}$ $\frac{64}{110}$

[1]

(b) Write these numbers in order, starting with the smallest.

$\frac{7}{12}$ 0.6 58% $\frac{8}{13}$ $\frac{2}{3}$

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

smallest

(c) Write 0.724 as a fraction in its simplest form.

..... [1]

(d) The mass, m grams, of a ball is 415 g, correct to the nearest 5 grams.

Complete the statement about the value of m.

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

(e) Ruth uses three-quarters of a bag of flour to make one cake.

Work out the number of bags of flour she needs to buy to make 7 cakes.

..... [3]

(f) A tin of soup costs \$$t$ and a packet of biscuits costs \$$p$.

(i) 3 tins of soup and 2 packets of biscuits cost \$15.50 .

Complete the equation.

$3t + 2p =$ ..... [1]

(ii) 5 tins of soup and 4 packets of biscuits cost \$28.50 .

Write down another equation in terms of t and p.

..... [1]

(iii) Solve the two simultaneous equations.
You must show all your working.

$t =$ .....

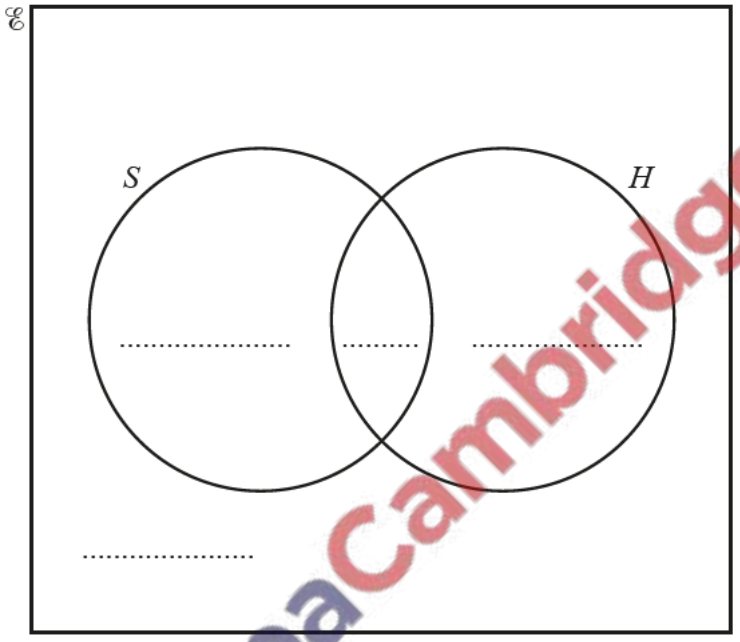
$p =$ ..... [3]

152. June/2021/Paper_32/No.7b

(b) 135 girls are asked if they like soccer (S) and if they like hockey (H).

$n(S) = 53$, $n(H) = 68$ and $n(S \cup H) = 110$.

(i) Complete the Venn diagram.



[3]

(ii) Write down $n(S \cap H)$.

.....

[1]

153. June/2021/Paper_33/No.1

Ray owns an electrical shop.

(a) The table shows the opening times of the shop.

Sunday	Closed
Monday	Closed
Tuesday	08 00 to 12 30 and 13 30 to 17 00
Wednesday	08 00 to 12 30 and 13 30 to 17 00
Thursday	08 00 to 12 30 and 13 30 to 17 00
Friday	08 00 to 12 30 and 13 30 to 17 00
Saturday	08 00 to 13 00 and 14 00 to 19 00

Work out how many hours the shop is open in one week.

..... hours [3]

(b) Saeed buys 2 ovens costing $440 each, 4 grills costing $184 each and 3 fridges costing $1280 each.

Calculate the total cost.

$ ..... [3]

(c) Alice buys 3 batteries costing $2.85 each.

Work out how much change she receives from $10.

$ ..... [2]

(d) Cherie works 32 hours one week and she is paid $8.48 per hour.
In another week she works 37 hours.
For each hour over 32 hours she works, she is paid 1.25 times her hourly rate.

Calculate her pay for the week she works 37 hours.

$ ..... [4]

(e) Ray buys a toaster for $36.
When he sells it he makes a profit of 40%.

Calculate the selling price of this toaster.

$ ..... [2]

154. June/2021/Paper_33/No.5

(a) Find.

(i) $\sqrt{320.41}$

..... [1]

(ii) $6.4^2 + 1.2^3$

..... [1]

(iii) the reciprocal of 2

..... [1]

(iv) 9^0

..... [1]

(v) $\frac{3}{7}$ of \$42

\$ ..... [1]

(vi) 12% of \$62

\$ ..... [1]

(b) Insert one pair of brackets in each statement to make it correct.

(i) $20 - 5 \div 5 - 3 = 0$ [1]

(ii) $20 - 5 \div 5 - 3 = 17.5$ [1]

(c) Write one of the symbols $<$, $>$ or $=$ in each statement to make it correct.

$\frac{7}{10}$ 0.07

$\frac{1}{5}$ 20%

$\frac{3}{8}$ 0.38

[2]

(d) **(i)** Write 90 as the product of its prime factors.

..... [2]

(ii) Find the lowest common multiple (LCM) of 35 and 90.

..... [1]

(iii) Find the highest common factor (HCF) of 35 and 90.

..... [1]

155. June/2021/Paper_33/No.7

Rita and Henry own an investment business.

(a) They share the profit in the ratio Rita : Henry = 3 : 5.
In one year they make a profit of $2 400 000.

Calculate Rita's share of the profit.

$ ..... [2]

(b) Henry invests $160 000 at a rate of 2.5% per year compound interest.

Calculate the value of this investment at the end of 3 years.

$ ..... [2]

(c) Rita invests $12 000 at a rate of r% per year.
The value of her investment at the end of one year is $12 408.

Work out the value of r.

$r =$ ..... [2]

(d) Rita and Henry decorate their office.
The cost, $\$c$, is \$10 800, correct to the nearest hundred dollars.

Complete this statement about the value of c.

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

156. June/2021/Paper_41/No.1

(a) The total cost of a taxi journey is calculated as

- \$0.50 per kilometre

plus

- \$0.40 per minute.

(i) Calculate the total cost of a journey of 32 km that takes 30 minutes.

\$ ..... [2]

(ii) The total cost of a journey of 100 km is \$98.

Show that the time taken is 2 hours.

[3]

(b) Three taxi drivers travel a total of 8190 km in the ratio 5 : 2 : 7.

Calculate the distance each driver travels.

Driver 1 ..... km

Driver 2 ..... km

Driver 3 ..... km [3]

(c) After midnight, the cost of any taxi journey increases by 45%.
One journey costs $84.10 after midnight.

Calculate the cost of the same journey before midnight.

$ ..... [2]

157. June/2021/Paper_41/No.4

(a) The exchange rate is 1 euro = \$1.142 .

(i) Johann changes \$500 into euros.

Calculate the number of euros Johann receives.
Give your answer correct to the nearest euro.

..... euros [2]

(ii) Johann buys a computer for \$329.
The same computer costs 275 euros.

Calculate the difference in cost in dollars.

\$ ..... [2]

(b) Lucy spends $\frac{3}{8}$ of the money she has saved this month on a book that costs \$5.25 .

Calculate how much money Lucy has saved this month.

\$ ..... [2]

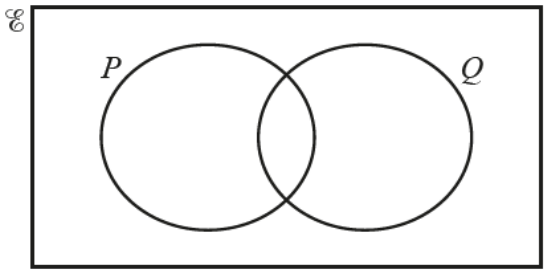
(c) Kamal invests \$6130 at a rate of r% per year compound interest.
The value of his investment at the end of 5 years is \$6669.

Calculate the value of r.

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

158. June/2021/Paper_41/No.6

(a) In the Venn diagram, shade the region $P' \cup Q$.

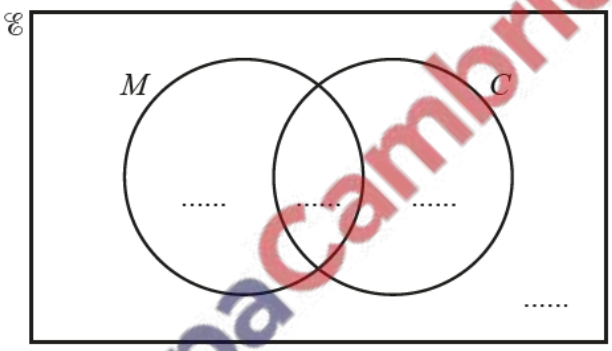


[1]

(b) There are 50 students in a group.

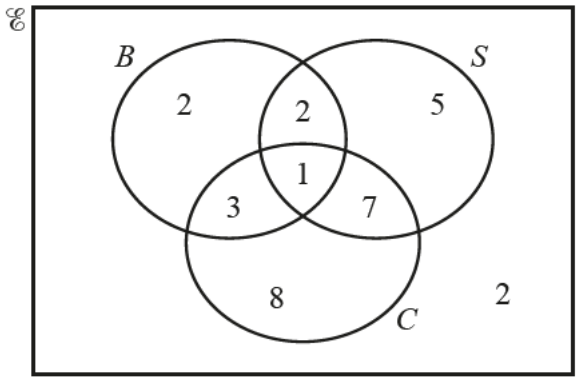
34 have a mobile phone (M).
39 have a computer (C).
5 have no mobile phone and no computer.

Complete the Venn diagram to show this information.



[2]

(c) The Venn diagram shows the number of students in a group of 30 who have brothers (B), sisters (S) or cousins (C).



(i) Write down the number of students who have brothers.

..... [1]

(ii) Write down the number of students who have cousins but do not have sisters.

..... [1]

(iii) Find $n(B \cup S \cup C)'$.

..... [1]

(iv) Use set notation to describe the set of students who have both cousins and sisters but do not have brothers.

..... [1]

(v) One student is picked at random from the 30 students.

Find the probability that this student has cousins.

..... [1]

(vi) Two students are picked at random from the students who have cousins.

Calculate the probability that both these students have brothers.

..... [3]

(vii) One student is picked at random from the 30 students.

Event A This student has sisters.
Event B This student has cousins but does not have brothers.

Explain why event A and event B are equally likely.

.....

..... [1]

159. June/2021/Paper_42/No.1

(a) A 2.5-litre tin of paint costs $13.50 .
In a sale, the cost is reduced by 14%.

(i) Work out the sale price of this tin of paint.

$ ..... [2]

(ii) Work out the cost of buying 42.5 litres of paint at this sale price.

$ ..... [2]

(b) Henri buys some paint in the ratio red paint : white paint : green paint = 2 : 8 : 5.

(i) Find the percentage of this paint that is white.

..... % [1]

(ii) Henri buys a total of 22.5 litres of paint.

Find the number of litres of green paint he buys.

..... litres [2]

(c) Maria paints a rectangular wall.
The length of the wall is 20.5 m and the height is 2.4 m, both correct to 1 decimal place.

One litre of paint covers an area of exactly $10\,m^2$.

Calculate the smallest number of 2.5-litre tins of paint she will need to be sure all the wall is painted.
Show all your working.

..... [4]

160. June/2021/Paper_43/No.1

(a) **(i)** Yasmin and Zak share an amount of money in the ratio 21 : 19.
Yasmin receives $6 more than Zak.

Calculate the total amount of money shared by Yasmin and Zak.

$ ..... [2]

(ii) In a sale, all prices are reduced by 15%.

(a) Yasmin buys a blouse with an original price of $40.

Calculate the sale price of the blouse.

$ ..... [2]

(b) Zak buys a shirt with a sale price of $29.75 .

Calculate the original price of the shirt.

$ ..... [2]

(b) Xavier's salary increases by 2% each year.
In 2010, his salary was $40 100.

(i) Calculate his salary in 2015.
Give your answer correct to the nearest dollar.

$ ..... [3]

(ii) In which year is Xavier's salary first greater than $47 500?

..... [3]

(c) In January 2020, the population of a town was 5% **more** than its population in January 2018.
In January 2021, the population of this town was 2% **less** than its population in January 2020.

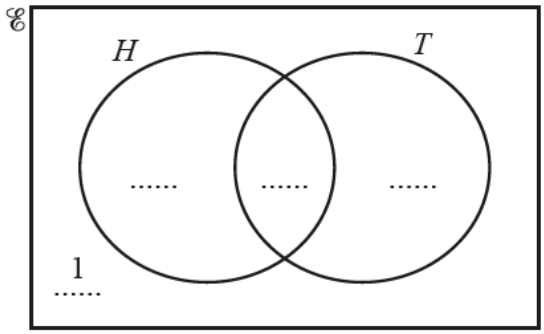
Calculate the overall percentage increase in the population from January 2018 to January 2021.

..... % [2]

161. June/2021/Paper_43/No.6

In a class of 24 students, 18 students like homework (H), 15 students like tests (T) and 1 student does not like homework and does not like tests.

(a) Complete the Venn diagram to show this information.



[2]

(b) Write down the number of students who like both homework and tests.

..... [1]

(c) Find $n(H' \cap T)$.

..... [1]

(d) A student is picked at random from the class.

Write down the probability that this student likes tests but does not like homework.

..... [1]

(e) Two students are picked at random from the class.

Find the probability that both students do not like homework and do not like tests.

..... [1]

(f) Two of the students who like homework are picked at random.

Find the probability that both students also like tests.

..... [3]