Numbers – 2023 Nov IGCSE 0580

1. Nov/2023/Paper_0580/11/No.2

Write down the value of the 8 in the number 58 317.

..... [1]

2. Nov/2023/Paper_0580/11/No.4

Find the value of $\sqrt[3]{5832}$.

..... [1]

3. Nov/2023/Paper_0580/11/No.5

A watch costs $12 400.
In a sale there is a discount of 16%.

Calculate the amount of the discount.

$ ..... [1]

4. Nov/2023/Paper_0580/11/No.7

Arjun lives in Delhi and Haru lives in Tokyo.
They play a computer game online at the same time.

They start at 14 45 Tokyo local time.
The game lasts 3 hours 50 minutes.
The local time in Delhi is 3 hours 30 minutes behind the local time in Tokyo.

Find the local time in Delhi when the game finishes.

..... [2]

5. Nov/2023/Paper_0580/11/No.11

Write 0.03682 correct to 2 significant figures.

..... [1]

6. Nov/2023/Paper_0580/11/No.12, 0580/21/No.4

The table shows some information about Amir's shopping.

Fruit	Cost per kilogram	Number of kilograms Amir buys	Cost
Oranges	$2.35	3.2	$.....
Bananas	$.....	2.8	$.....
		Total	$13.54

Complete the table.

7. Nov/2023/Paper_0580/11/No.15

Find the highest common factor (HCF) of 140 and 126.

..... [2]

8. Nov/2023/Paper_0580/11/No.18

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

$$\frac{36.9+24.2}{3.8-1.2}.$$

You must show all your working.

..... [2]

9. Nov/2023/Paper_0580/11/No.19

Indira invests \$6000 at a rate of r% per year simple interest.
At the end of 4 years the value of her investment is \$6840.

Find the value of r.

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

10. Nov/2023/Paper_0580/11/No.21

(a) Write these numbers in standard form.

(i) 45 000

..... [1]

(ii) 0.0063

..... [1]

(b) Calculate $8.2 \times 10^{-1} \times 150000$.
Give your answer in standard form.

..... [2]

11. Nov/2023/Paper_0580/11/No.22

The length, s metres, of a ship is 287 m, correct to the nearest metre.

Complete this statement about the value of s.

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

12. Nov/2023/Paper_0580/11/No.24

(a) Change $1.2\,m^2$ into mm^2.

..... mm^2 [1]

(b) The speed limit on a road is 80 km/h.
Sophie drives at a speed of 1200 m/min.

Show that Sophie drives at a speed lower than the speed limit.

[2]

13. Nov/2023/Paper_0580/12/No.1

Write $\frac{8}{10}$ as a decimal.

..... [1]

14. Nov/2023/Paper_0580/12/No.2

Asha works in a café.
Her wage is calculated using the formula wage = hourly rate × number of hours + bonus.
Her hourly rate is $11.52 .
One week Asha works 25 hours and receives a bonus of $5.40 .

Work out her wage for this week.

$ ..... [2]

15. Nov/2023/Paper_0580/12/No.4

Work out $\frac{2}{5}$ of 180.

..... [1]

16. Nov/2023/Paper_0580/12/No.5

Write these numbers in order, starting with the smallest.

$\frac{3}{16}$ 18.7% 0.19 $\frac{9}{50}$

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

smallest

17. Nov/2023/Paper_0580/12/No.6, 0580/22/No.2

Write down the number that is 9 greater than -23.

..... [1]

18. Nov/2023/Paper_0580/12/No.8, 0580/22/No.1

Write 24.07839

(a) correct to 2 decimal places

..... [1]

(b) correct to the nearest 10.

..... [1]

19. Nov/2023/Paper_0580/12/No.10, 0580/22/No.4

Change 62 000 millimetres into kilometres.

..... km [1]

20. Nov/2023/Paper_0580/12/No.12, 0580/22/No.6

(a) Explain why 111 is not a prime number.

..... [1]

(b) Find a prime number between 110 and 120.

..... [1]

21. Nov/2023/Paper_0580/12/No.16

Filip invests $4000 for 3 years at a rate of 2.5% per year simple interest.

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

$ ..... [3]

22. Nov/2023/Paper_0580/12/No.19

Without using a calculator, work out $3\frac{1}{8} - 1\frac{3}{4}$.

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

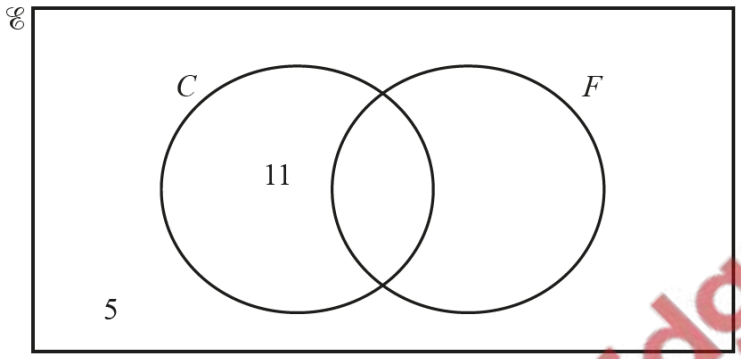
..... [3]

23. Nov/2023/Paper_0580/12/No.20

$\mathscr{E}$ = {students in a class}
C = {students who play cricket}
F = {students who play football}

There are 36 students in the class.
15 students play cricket.
20 students play football.

(a)



Complete the Venn diagram. [2]

(b) Write down $n(C \cup F)$.

..... [1]

24. Nov/2023/Paper_0580/12/No.23

Bell *A* rings every 22 minutes.
Bell *B* rings every 14 minutes.
Both bells ring at 09 00.

Work out the next time both bells ring together.

..... [3]

25. Nov/2023/Paper_0580/13/No.2

Write down

(a) all the factors of 32

..... [2]

(b) the reciprocal of $\frac{1}{8}$

..... [1]

(c) the value of the 7 in the number 473 285.

..... [1]

26. Nov/2023/Paper_0580/13/No.4, 0580/13/No.2

61	63	64	66	68	69

From this list, write down

(a) a cube number

..... [1]

(b) a prime number.

..... [1]

27. Nov/2023/Paper_0580/13/No.5, 0580/13/No.1

Tara goes on a journey by train.
The train leaves at 06 48.
The journey takes 12 hours and 35 minutes.

Find the time when Tara arrives.

..... [1]

28. Nov/2023/Paper_0580/13/No.13, 0580/13/No.7

Without using a calculator, work out $1\frac{5}{6} \div \frac{11}{15}$.

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

..... [3]

29. Nov/2023/Paper_0580/13/No.15, 0580/13/No.4

Shubhu invests $750 in a savings account for 5 years.
The account pays simple interest at a rate of 1.8% per year.

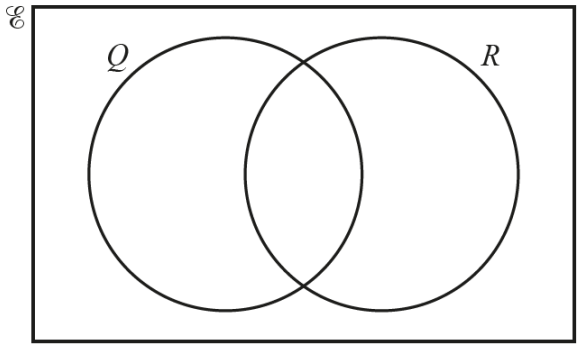
Calculate the total interest she earns during the 5 years.

$ ..... [2]

30. Nov/2023/Paper_0580/13/No.21

$\mathscr{E} = \{2,\ 4,\ 8,\ 9,\ 10,\ 12\}$
$Q = \{\text{square numbers}\}$
$R = \{\text{multiples of 4}\}$

(a) Use this information to complete the Venn diagram.



[2]

(b) Write down $n(Q \cap R)$.

..... [1]

31. Nov/2023/Paper_0580/13/No.22

Find the highest common factor (HCF) of 48 and 80.

..... [2]

32. Nov/2023/Paper_0580/21/No.7

The exchange rate between Singapore dollars and euros is 1 Singapore dollar = 0.62 euros.

Find the value of 161.20 euros in Singapore dollars.

..... Singapore dollars [1]

33. Nov/2023/Paper_0580/21/No.8

Calculate.

$$7\frac{3}{11} \times 3\frac{3}{10}$$

..... [1]

34. Nov/2023/Paper_0580/21/No.9

Find the highest common factor (HCF) of 140 and 126.

..... [2]

35. Nov/2023/Paper_0580/21/No.12

Write $0.4\dot{2}$ as a fraction in its simplest form.
You must show all your working.

..... [3]

36. Nov/2023/Paper_0580/21/No.13

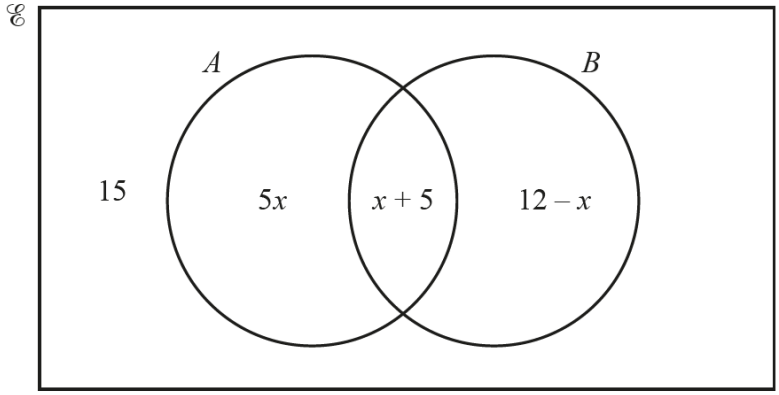
At the end of 2021 there were 27 000 rhinos living in the wild.
The number of rhinos is expected to decrease exponentially by 3% each year.

Work out the number of rhinos expected to be living in the wild 4 years later, at the end of 2025.
Give your answer correct to the nearest whole number.

..... [3]

37. Nov/2023/Paper_0580/21/No.14

(a)

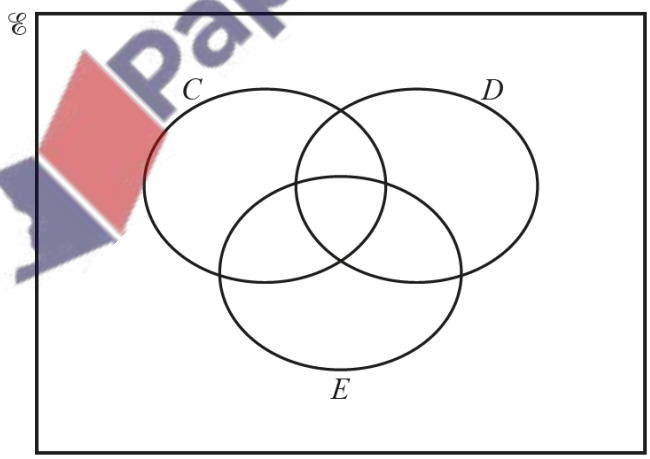


The Venn diagram shows information about the number of elements in sets A, B and $\mathscr{E}$.
$n(\mathscr{E}) = 52$.

Find $n(A \cap B)$.

..... [3]

(b) In this Venn diagram, shade the region $C \cap D \cap E$.



[1]

38. Nov/2023/Paper_0580/22/No.8

Without using a calculator, work out $3\frac{1}{8} - 1\frac{3}{4}$.

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

..... [3]

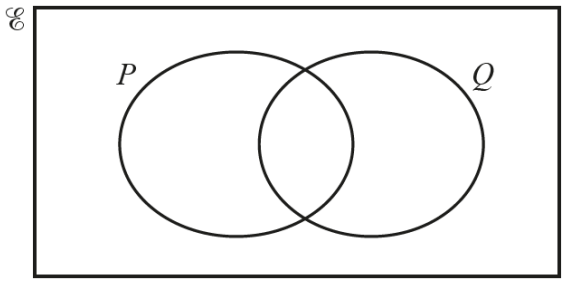
39. Nov/2023/Paper_0580/22/No.9

Write 90 as a product of its prime factors.

..... [2]

40. Nov/2023/Paper_0580/22/No.15

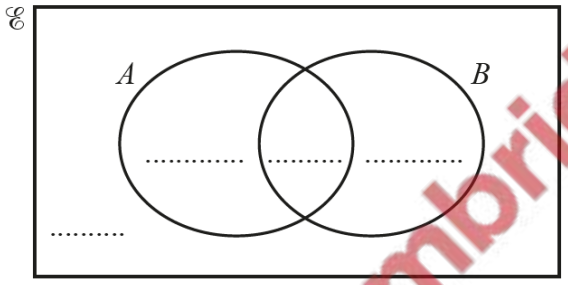
(a) On the Venn diagram, shade the region $P \cup Q'$.



[1]

(b) $n(\mathscr{E}) = 20$ $n(A \cup B)' = 1$ $n(A) = 12$ $n(B) = 10$

Complete the Venn diagram.



[2]

41. Nov/2023/Paper_0580/22/No.16

Find the lowest common multiple (LCM) of $12x^8$ and $8x^{12}$.

..... [2]

42. Nov/2023/Paper_0580/23/No.8

Find the highest common factor (HCF) of 48 and 80.

..... [2]

43. Nov/2023/Paper_0580/23/No.11

A bronze sphere has radius 3.6 cm.
The density of bronze is 8.05 g/cm^3.

Find the mass of the sphere.
Give your answer **in kilograms**, correct to the nearest gram.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

[Density = mass ÷ volume.]

..... kg [4]

44. Nov/2023/Paper_0580/23/No.12

Oliver sent 22% more messages in June than in May.
He sent 305 messages in June.

Find how many more messages he sent in June than in May.

..... [3]

45. Nov/2023/Paper_0580/23/No.18

F is proportional to the product of m and a.

Calculate the percentage change in F when m is increased by 40% and a is decreased by 15%.

..... % [3]

46. Nov/2023/Paper_0580/31/No.1

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

..... [1]

(b) Write 37 508 correct to the nearest thousand.

..... [1]

(c) 6 9 $\sqrt{100}$ 28 31 $\sqrt{1000}$ 32 36

From this list of numbers, write down

(i) a factor of 18

..... [1]

(ii) a multiple of 12

..... [1]

(iii) a square number

..... [1]

(iv) a prime number

..... [1]

(v) an irrational number.

..... [1]

(d) Put one pair of brackets in each statement to make it correct.

(i) $24 - 4 \times 3 + 2 = 62$ [1]

(ii) $24 - 4 \times 3 + 2 = 4$ [1]

(e) Write $\frac{3}{4}$ as a decimal.

..... [1]

(f) Work out $\frac{3}{7}$ of 126.

..... [1]

(g) Write down the value of the reciprocal of 0.5 .

..... [1]

(h) **Without using a calculator**, work out $5\frac{2}{3} - 2\frac{1}{5}$.
You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

47. Nov/2023/Paper_0580/31/No.9

(a) Pure gold costs $42 per gram.

The fraction of pure gold in an object is measured in carats.
One carat means $\frac{1}{24}$ of the mass of an object is pure gold.

Henry buys a 9-carat gold bracelet weighing 16 g.
The price of the bracelet is $204.

Is the price of the bracelet more or less than the cost of the pure gold in it?
You must show your working.

[4]

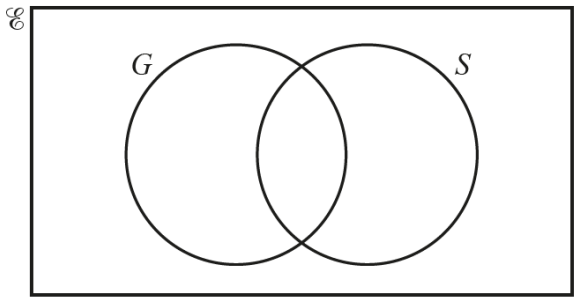
(b) A clock made of metals has a mass of 1080 g.
The mass of each metal in the clock is in the ratio
copper : zinc : other metals = 21 : 14 : 1.

Calculate the mass of copper in this clock.

..... g [2]

(c) There are 110 people in a group.
G = { people who own gold jewellery }
S = { people who own silver jewellery }

18 people own both gold jewellery and silver jewellery.
46 people own gold jewellery.
11 people own no gold jewellery and no silver jewellery.



(i) Complete the Venn diagram. [2]

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

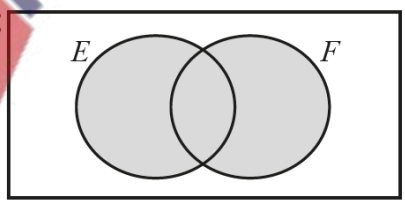
..... [1]

(iii) One of the 110 people is chosen at random.

Write down the probability that this person owns gold jewellery but not silver jewellery.

..... [1]

(d)



Use set notation to describe the shaded region.

..... [1]

48. Nov/2023/Paper_0580/32/No.3

(a) Write the number fourteen thousand and ninety-seven in figures.

..... [1]

(b) Write down a common multiple of 17 and 5.

..... [1]

(c) Write 0.25 as a percentage.

..... % [1]

(d) Find the value of

(i) 7^5

..... [1]

(ii) 8^0.

..... [1]

(e) Ranjit buys some plants and sells $\frac{5}{11}$ of them.
He sells 190 plants.

Work out how many plants he buys.

..... [2]

(f) Factorise completely.

$15x^3y - 3x$

..... [2]

(g) Make n the subject of the formula $V = 3n + t$.

$n =$ ..... [2]

(h) $7^{15} \div 7^{x} = 7^{9}$

Find the value of x.

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

49. Nov/2023/Paper_0580/32/No.7

Elize, Lily and Marco start a business.

(a) Elize invests $5000.
Lily invests $8000.
Marco invests $3000.

After one year they make a profit of $40 000.
They share this profit in the ratio of their investments.

Work out how much they each receive.

Elize $ .....

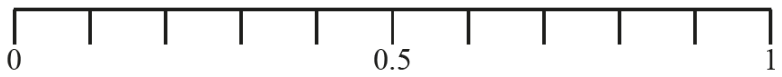
Lily $ .....

Marco $ ..... [3]

(b) **(i)** Lily buys 20 rolls of ribbon.
8 are red, 6 are blue, 4 are yellow and 2 are pink.
A roll of ribbon is chosen at random.

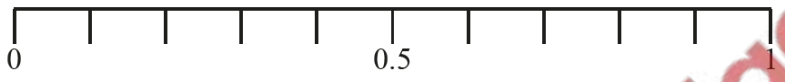
On the probability scale, draw an arrow (↓) to show the probability that this roll is

(a) yellow



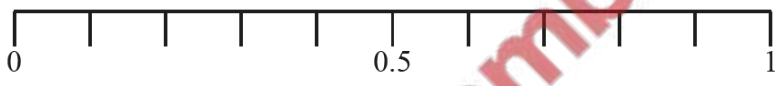
[1]

(b) not red



[1]

(c) green.



[1]

(ii) The length, l m, of a roll of ribbon is 120 m, correct to the nearest metre.

Complete this statement about the value of l.

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

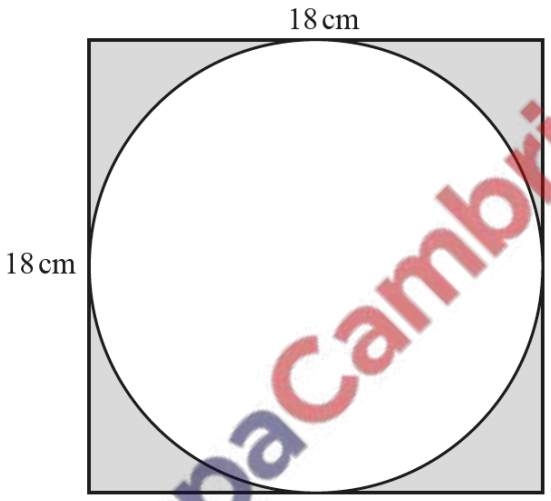
(c) Elize buys some picture frames.
The frames cost \$5.80 each in New York and 4.50 euros each in Paris.
The exchange rate is 1 euro = \$1.37 .

Calculate the difference in the cost in euros.
Give your answer correct to 2 decimal places.

..... euros [3]

(d) Elize buys a framed picture.

(i)



NOT TO SCALE

The picture is a circle with diameter 18 cm.
The frame is a square of side length 18 cm.

Calculate the shaded area.

..... cm^2 [3]

(ii) Elize buys the framed picture for \$12.50 .
She sells the framed picture for \$20.25 .

Calculate the percentage profit.

..... % [2]

50. Nov/2023/Paper_0580/33/No.1

(a) Tom has a restaurant bill.

Soup	$.....
Pasta	$ 13.30
Ice cream	$ 4.80
Drinks	$ 3.81
Total cost	$ 25.40

(i) Complete the bill to show the cost of soup.

[2]

(ii) Find the cost of drinks as a percentage of the total cost.

.....% [1]

(b) **(i)** Work out $\frac{2}{5}$ of $2400.

$ ..... [1]

(ii) Decrease $3450 by 18%.

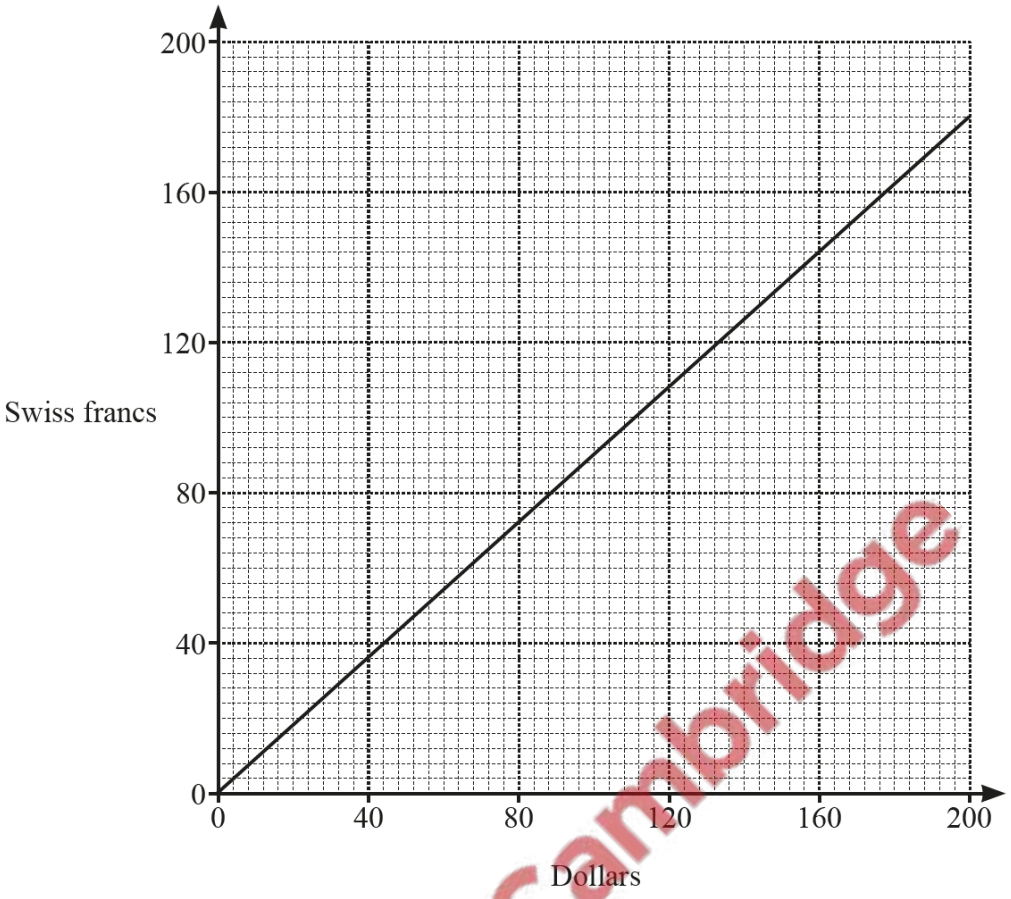
$ ..... [2]

(c) Amelia invests $14 000 at a rate of 1.6% per year compound interest.

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

$ ..... [3]

(d) This conversion graph can be used to change between dollars and Swiss francs.



(i) Use the graph to change

(a) $80 to Swiss francs

..... Swiss francs [1]

(b) 108 Swiss francs to dollars.

$ ..... [1]

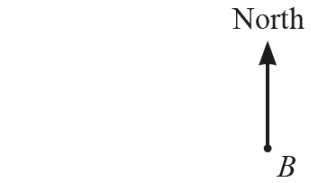
(ii) Explain how you can use the graph to change $360 to Swiss francs.

.....

..... [1]

51. Nov/2023/Paper_0580/33/No.2

(a) Bayside, Millwater and Westbridge are towns beside a lake.
The scale drawing shows the positions of Bayside (B) and Millwater (M).
The scale is 1 centimetre represents 2 kilometres.



Scale: 1 cm to 2 km

(i) Find the actual distance between Bayside and Millwater.

..... km [2]

(ii) Westbridge (W) is 17 km from Bayside on a bearing of 155°.

On the scale drawing, mark the position of Westbridge.

[2]

(b) **(i)** A boat travels from Bayside to Westbridge.
The table gives some information about its journey.

Bayside	departs	10 50
Millwater	arrives	11 36
	departs	11 45
Westbridge	arrives	13 07

Work out how long the boat takes to travel from **Millwater** to Westbridge.
Give your answer in hours and minutes.

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

(ii) The boat returns directly to Bayside.
It takes 1 hour 20 minutes to travel the 17 km.

Work out the average speed of this journey.

..... km/h [2]

(c) Here are the ticket prices for a boat trip from Bayside to Westbridge.

1 person $9.80	Group of 6 people $57.30	Group of 15 people $138.75

(i) Calculate the cost per person for a group of 15 people.

$ ..... [1]

(ii) A group of 24 people buy tickets for the boat trip from Bayside to Westbridge.

Calculate the least amount of money the group needs to pay.

$ ..... [2]

52. Nov/2023/Paper_0580/33/No.3

(a) Aneel has 80 tea bags, $\frac{1}{2}$ kg of sugar and 1 litre of milk.
To make a cup of tea he uses:

- 1 tea bag
- 8 grams of sugar
- 40 millilitres of milk.

(i) In the morning, Aneel makes 15 cups of tea.

Work out

(a) the fraction of the tea bags he uses, in its simplest form

..... [2]

(b) the mass of sugar, in grams, he has left.

..... g [2]

(ii) During the day, Aneel uses all of the milk to make cups of tea.

Work out the total number of cups of tea Aneel makes.

..... [1]

(b) Bobby, Carl and Davood share \$6875 in the ratio Bobby : Carl : Davood = 6 : 8 : 11.

Calculate the amount of money they each receive.

Bobby \$.....

Carl \$.....

Davood \$..... [3]

(c) **(i)** Write $\frac{3^2 \times 3^4}{3^6}$ as a power of 3.

..... [1]

(ii) Write the value of 2^{-4} as a decimal.

..... [1]

(d) Simplify.

(i) $(b^5)^3$

..... [1]

(ii) $\left(\frac{4}{m}\right)^{-2}$

..... [1]

(e) $30 = 2 \times 3 \times 5$ $84 = 2^2 \times 3 \times 7$

Use this information to find the lowest common multiple (LCM) of 30 and 84.

..... [2]

(f) $\frac{2}{9}$ $\sqrt{7}$ $\frac{5}{4}$ $\sqrt{16}$ 2^3

Put a ring around the irrational number in this list. [1]

53. Nov/2023/Paper_0580/41/No.3

(a) The table shows information about some of the planets in the solar system.

Planet	Diameter (km)	Average distance from the Sun (km)
Earth	12 800	1.496×10^8
Mars	6 800	2.279×10^8
Jupiter	143 000	7.786×10^8
Saturn	120 500	1.434×10^9
Neptune	49 500	4.495×10^9

(i) The average distance of Mars from the Sun is 2.279×10^8 km.

Write this distance as an ordinary number.

..... km [1]

(ii) The planet Uranus has a diameter that is 35.8% of the diameter of Jupiter.

Calculate the diameter of Uranus.

..... km [2]

(iii) The ratio diameter of Neptune : diameter of Saturn can be written in the form 1 : n.

Find the value of n.

n = ... [1]

(iv) Find the average distance of Neptune from the Sun as a percentage of the average distance of the Earth from the Sun.

.....% [2]

(v) Distances within the solar system are also measured in astronomical units (AU).
The average distance of Jupiter from the Sun is 5.20 AU.

Calculate the average distance of Mars from the Sun in astronomical units.

..... AU [2]

(vi) The diameter of Mars is 39.2% greater than the diameter of Mercury.

Calculate the diameter of Mercury.

..... km [2]

(b) One light year is the distance that light travels in a year of 365.25 days.
The speed of light is 2.9979×10^5 kilometres per second.

(i) Show that one light year is 9.461×10^{12} km, correct to 4 significant figures.

[2]

(ii) The distance from the Andromeda Galaxy to Earth is 2.40×10^{19} km.

Calculate the time taken for light to travel from this galaxy to Earth.
Give your answer in millions of years.

..... million years [2]

54. Nov/2023/Paper_0580/42/No.3

(a) The value of Priya's car decreases by 10% every year.
The value today is $7695.

(i) Calculate the value of the car after one year.

$ ..... [2]

(ii) Calculate the value of the car one year ago.

$ ..... [2]

(b) Ali invests $600 at a rate of 2% per year simple interest.

Calculate the value of Ali's investment at the end of 5 years.

$ ..... [3]

(c) Sara invests $500 at a rate of r% per year compound interest.
At the end of 12 years, the value of Sara's investment is $601.35, correct to the nearest cent.

Find the value of r.

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

(d) The mass of a radioactive substance decreases exponentially at a rate of 3% each day.

(i) Find the overall percentage decrease at the end of 10 days.

..... % [2]

(ii) Find the number of whole days it takes until the mass of this substance is one half of its original amount.

..... [3]

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The table shows the amount received when exchanging **$100** in some countries.

Country	Amount received for $100
Wales	77.05 pounds
India	7437.05 rupees
China	671.20 yuan
Spain	85.35 euros

(a) Brad changes $250 to Indian rupees.

Calculate the amount he receives correct to the nearest rupee.

..... rupees [2]

(b) Wang changes 5400 Chinese yuan into dollars.

Calculate how much he receives in dollars, correct to the nearest cent.

$ ..... [2]

(c) Gretal lives in Spain and goes on holiday to Wales.
She spends 3500 euros in total on travel and hotels in the ratio

travel : hotels = 4 : 3.

(i) Work out how much Gretal spends, in euros, on travel.

..... euros [2]

(ii) Work out how much she spends, **in pounds**, on hotels.

..... pounds [3]

(iii) Gretal flies home to Spain.
The plane flies a distance of 2200 km, correct to the nearest 100 km.
The average speed of the plane is 740 km/h, correct to the nearest 20 km/h.

Calculate the lower bound of the time taken, in hours and minutes, for this flight.

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