THE G C SCHOOL OF CAREERS

ENTRANCE EXAMINATION

SCHOOL YEAR 2023-2024

MATHEMATICS

This examination paper consists of 21 pages, including this page.

THE G C SCHOOL OF CAREERS

ENTRANCE EXAMINATION

SCHOOL YEAR 2023-2024

GOOD LUCK

Time: 1 hour and 30 minutes

MATHEMATICS

- This paper consists of **25 questions**.

- Answer **ALL** the questions in the space provided.

- Show **all your workings**.

- The use of a calculator is **not allowed**.

- Write your answers **clearly**.

1. Calculate the following:

a) $\dfrac{1}{1} + \dfrac{1}{\dfrac{1}{2}} + \dfrac{1}{\dfrac{1}{3}} =$ **(2)**

Answer: _____

b) $\left(6\dfrac{2}{8} - 3\dfrac{1}{4}\right) \div 5\dfrac{1}{7} =$

(3)

Answer: _____

c) $\dfrac{0.35 \times 8 + 3^3 \times \left(\dfrac{1}{3}\right)^2}{\left(\dfrac{1}{5}\right)^2} =$

(3)

Answer: _____

2. 200 students chose one language as an optional subject. Each student chose one of these languages: French, Spanish, German.

Out of the 200 students,

- 90 are boys and the rest are girls
- 70 chose Spanish
- 60 out of the 104 students who chose French, are boys
- 18 girls chose German.

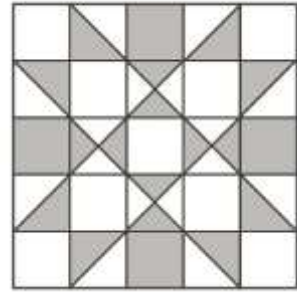Work out how many boys chose Spanish.

(3)

Answer: _____

---

3. There are 30 women and 20 men at a gym.

The mean height of all 50 people is 167.6 cm. The mean height of the 20 men is 182 cm. Work out the mean height of the 30 women.

(4)

Answer: _____

4. Find the percentage of the shaded part in the figure.

(2)

Answer: _____

---

5. Given that the first sign represents number 22 and the second sign represents number 62, find which number represents ➡ and ▲.

(4)

1st

2nd

Answer: ▲ _____ , ➡ _____

6. Complete the following:

(3)

1

$1 + 3 \ = \boxed{}$

$1 + 3 + 5 = \boxed{}$

$1 + 3 + 5 + 7 = \boxed{}$

$1 + 3 + 5 + 7 + 9 = \boxed{}$

.

.

.

.

$1 + 3 + 5 + 7 + 9 + … + 59 = \boxed{}$

---

7. Find the smallest number that can be divided by 12 or 9 and leave a remainder of 4 in both cases.

(3)

Answer: _____

8.

| 0.2 | 2 | 10 | 0.1 | 0.05 | 1 |

a) Choose two of the cards above so that you have the smallest possible answer.

(2)

$$\boxed{} \times \boxed{} = \quad \ldots\ldots\ldots$$

b) Choose three cards so that the equation below is valid.

(3)

$$\boxed{} \div \boxed{} \times \boxed{} = 20$$

9. The table below is part of a bus timetable between City A and City F.

Line	1	2	3	4	5
City A	07:20		07:40		07:55
City B	07:49		08:09		08:24
City C	08:00	08:14	08:20	08:29	08:36
City D	08:09	08:20	08:29	08:37	08:44
City E	08:14	08:34	08:41	08:48	08:58
City F	08:32	08:51	08:58	09:05	09:15

a) How many minutes does the 07:20 bus take to go from City A to City D?

(1)

Answer: _____

Anna lives in City B and works in City F. She goes to work by bus.

One day Anna leaves her house at 08:00.

She takes 7 minutes to walk to the bus stop in City B. She takes 15 minutes to walk from the bus stop in City F to her office.
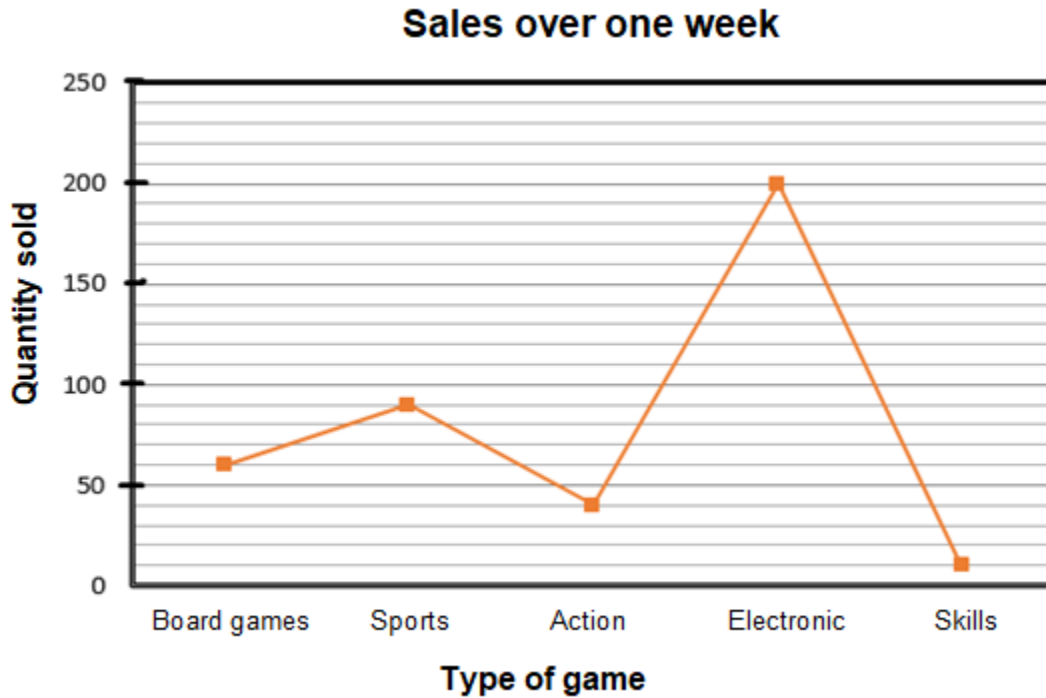
Anna needs to be at work at 09:20.

Given that Anna was not late that day, find

c) which bus line she took and what time exactly she arrived at her office.

(2)

Answer: Line _____, Time _____

10. The graph below shows a toy store's sales over one week. Find:

Sales over one week

a) how many games were sold in total.

(2)

Answer: _____

b) what part of sales did the best-selling game score.

(2)

Answer: _____

c) what type of game does the 10% of students prefer.

(1)

Answer: _____

11. There were 500 employees working at a company. 12% of them were women. Last week, the company hired 80 more employees, so now 20% of all employees are women. Find the percentages of female employees hired last week.

(4)

Answer: _____

---

12. Numbers 1 to 1000 are placed in columns as shown in the table. Find under which column (A, B, C, D, E, F) will you find number 1000.

A	B	C	D	E	F
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	…	…	…
…					

(3)

Answer: _____

13. Nikos has 25 two-wheeled and three-wheeled bicycles in his shop. If all the bicycles together have 64 wheels, find how many two-wheeled and how many three wheeled bicycles Nikos has.

(4)

Answer: Two-wheeled: _____, Three-wheeled: _____

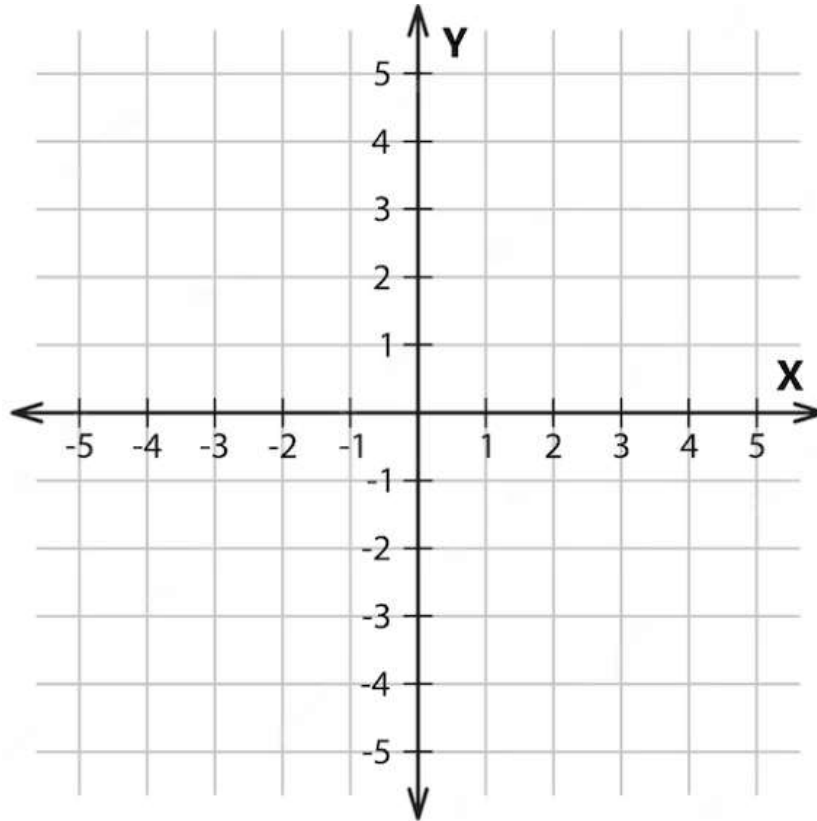**14.** In a basketball tournament, a specific team has so far played $\frac{2}{3}$ of its games. It has won 17 games and lost 3. The team aims to have won $\frac{4}{5}$ of all its games by the end of the tournament. Find how many wins the team must achieve in its remaining games, to reach its target.

(4)

Answer: _____

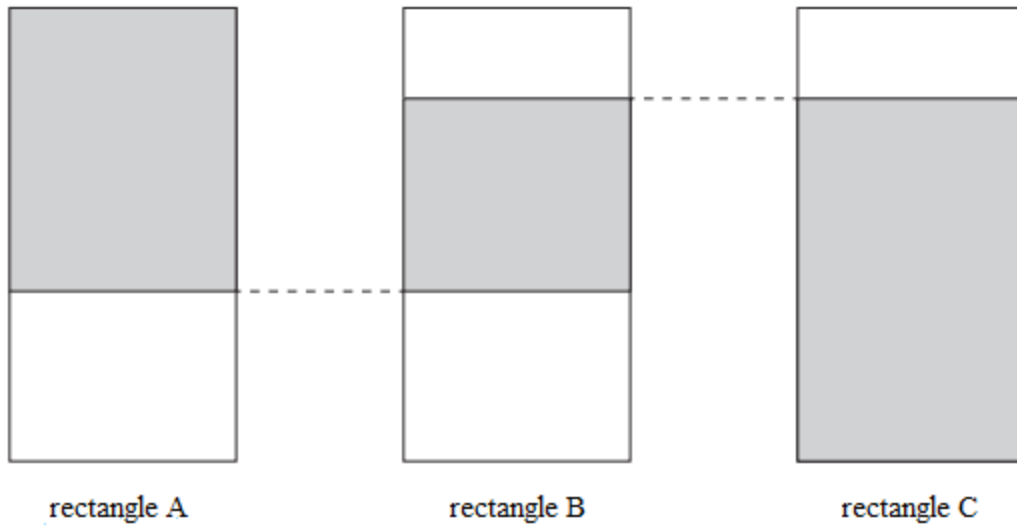**15.** a) Place the points with coordinates A(-4, 0), B(1, 5) and C(4, 2) on the axes.

(3)

b) Find the coordinates of point D so that ABCD is a rectangle.

(1)

16.

rectangle A   rectangle B   rectangle C

- $\frac{5}{8}$ of rectangle A is shaded.
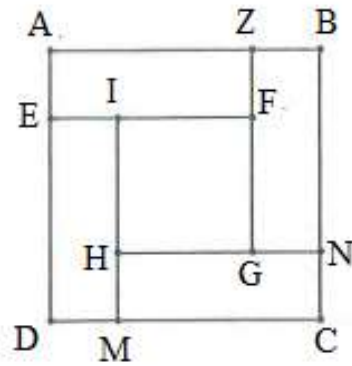- 80% of rectangle C is shaded.

What percentage of rectangle B is shaded?

(3)

Answer: _____

17. Each of the equal right-angled parallelograms AZFE, ZBNG, NCMH and EIMD has a length three times its width. If the perimeter of the quadrilateral ABCD is equal to 80cm, find the area of the quadrilateral IFGH.
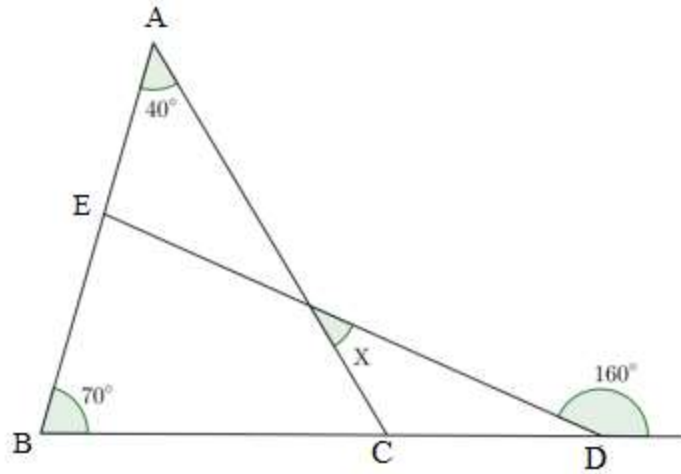
(4)

A   Z   B

I

E   F

H   N

G

D   M   C

Answer: _____

18. a) Find angle x in the diagram.
   Show all your steps.

(3)

Answer: X = _____

b) Name the triangle BED based on its angles.

(1)

Answer: _____

19. With a piece of rope I can make a rectangle with an area of 288cm^2 and a length of 18cm. With the same piece of rope, I can also make an isosceles triangle with its base side twice as long as each of its other two sides.

Find:

a) the length of the sides of the triangle.

(4)

Answer: _____

If the height of the triangle is the same as the length of the rectangle,

b) find the area of the triangle.

(1)

Answer: _____

20. In an animal care centre, a rabbit is on a nutrition plan. Every day, it eats 140 grams of food A, 10% of which (its weight) is protein. It also eats a certain quantity of food B. The rabbit needs to eat 300 grams of food every day, 38 grams of which must be protein.

Find:

a) how many grams of food B the rabbit should eat per day.

(1)

Answer: _____

b) how many grams of protein food B contains.

(2)

Answer: _____

c) the percentage of protein in food B.

(2)

Answer: _____

21. If a barrel is filled to the top with oil, it holds 200 litres.

The barrel now holds a certain quantity of oil. Find the quantity of oil in the barrel (in litres), knowing that if we subtract 50 litres from this quantity, the barrel will be $\dfrac{3}{5}$ full.

(3)

Answer: _____

22. At her job, Niki works 30 hours per week and earns €7.80 per hour. If she works more than 30 hours per week, every extra hour is paid at the ratio $1:\dfrac{3}{2}.$ Find how much Niki will earn in a week if she works 45 hours.

(4)

Answer: _____

23. Today George is 7 years old and the sum of his parents' ages is 74 years. When the sum of his parents' ages will be 92 years, George's father will be three times as old as George.

Find:

a) after how many years the sum of George's parents'ages will be 92.

(1)

Answer: _____

b) how old George's mother was when she gave birth to him.

(3)

Answer: _____

24. 60% of the people watching a movie are adults. The rest of the people are children, $\frac{3}{4}$ of which are boys. There are 150 fewer girls than adults. Find:

a) how many adults and how many children are watching the movie.

(4)

Answer: _____

During the movie some more children came, so the number of children became equal to $\frac{8}{5}$ of adults.

b) How many extra children came?

(2)

Answer: _____

25. If George gave Dimitris €100, then the two boys would have the same amount of money. If Dimitris gave €80 to George, then George would have three times as much money as Dimitris. Find how much money each boy has.

(3)

Answer: George _____

              Dimitris _____

END