

## Sample Scholarship Exam Questions

NB List is not explicit but gives ideas of the types of questions, vocabulary usage and core skills. The focus is on the process and showing method rather than the sole answer.

### Mathematics

1.

$$3(2^4 - 11) + 3 \times 2^2 - 4$$

2.

Replace each  $\square$  with an operation to make the statement true.

**a**  $1 + 15 \square 3 = 6$

**b**  $(18 \square 2) \div 10 = 2$

**c**  $15 \square 3 + 2 \square 5 = 15$

3.

Change just one operation in each statement to make it true.

**a**  $7 \times 3 + 4 \times 5 = 1$

**b**  $(12 - 6) \times 3 + 10 \div 5 = 4$

**c**  $24 - (10 - 6) + 2 \times 5 = 16$

4.

The game '24' is a number game where players are given four numbers and must use them to create an expression that equals 24. Players can use any of the operations (+, -,  $\times$ ,  $\div$ ) as well as exponents and parentheses. For each group of four numbers listed below, write down an expression that equals 24 using *each number* once.

**a** 1, 5, 7, 8    **b** 3, 7, 8, 8    **c** 2, 3, 6, 10    **d** 7, 6, 10, 12    **e** 2, 6, 6, 9

5.

Which numbers are equivalent in each of these sets?

**a**  $\frac{42}{150}$     16%    0.28    **b**  $\frac{17}{34}$     4%    0.4

$\frac{21}{60}$     28%    0.286     $\frac{104}{260}$     44%    0.40

6.

The war in Syria, which led to millions of refugees, also increased prices of goods dramatically.

- a A shawarma sandwich used to cost 100 Syrian pounds (SYP), but has now increased by 100%. What is the new price of the sandwich?
- b A tax of 10% was then added by the government on the shawarma sandwich. What is the new price of the sandwich?



- c The price of six eggs was 120 SYP and increased by 550%. What is the new price of six eggs?
- d The price of a kilogram of butter used to be 520 SYP. However, that has increased by 250%. What is the new price of a kilogram of butter?
- e Butter could be replaced by margarine, the cost of which is only 350 SYP per kilogram. Using the new price of butter, what percentage of the price of a kilogram of butter is this?
- f Imagine you are living in Syria and the price of food is increasing as you have seen. How would it feel to be the head of a family trying to provide for them, despite your salary not increasing? What would you consider as your options?

7.

- a Draw the next two shapes in the sequence below.



- b Explain the pattern in words. How do you find the next number in the sequence?
- c Is this a linear pattern? Explain.
- d Determine what the 30th term in the sequence would be, without drawing it. How do you know?
- e If one of the shapes has  $w$  water droplets in it, how many droplets will there be in the next shape?
- f Will the number 40 be in this sequence? Explain why or why not.

8.

Draw a pattern for the first three terms in each of the following sequences. Then draw the next two shapes in each pattern.

**a** 3, 7, 11

**b** 1, 9, 25

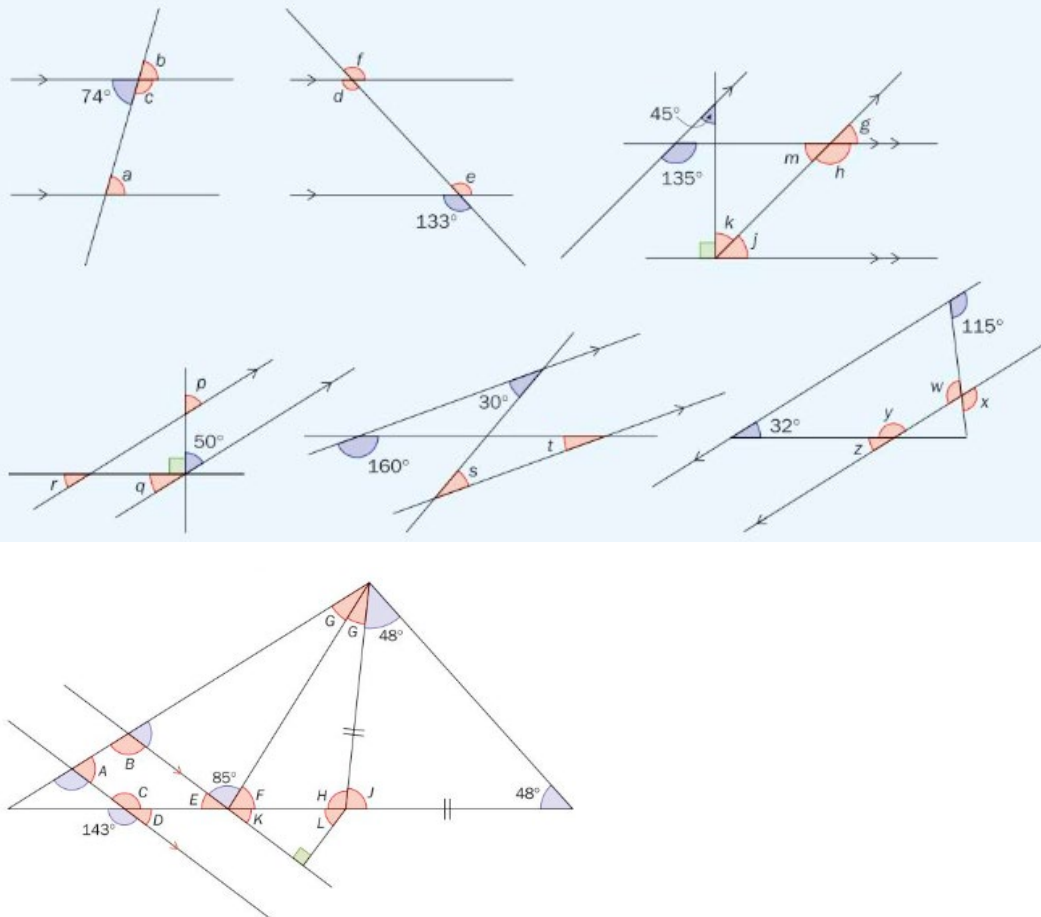
9.

Maria starts the pattern below. She stays up all night and falls asleep after finishing the 914th term. What shape was it?



10.

Determine the measure of the indicated angles.



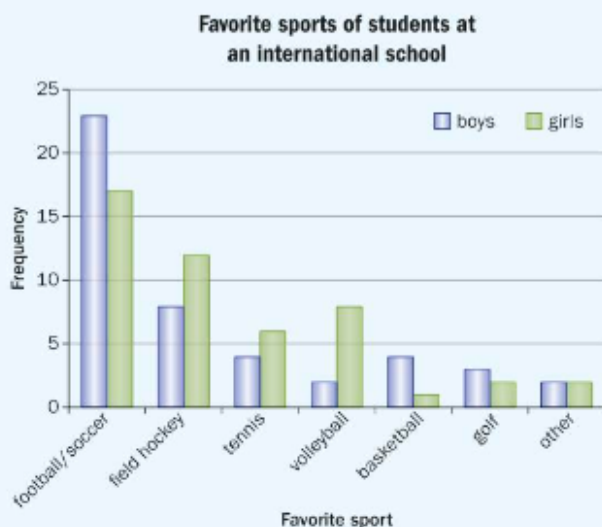
11.

Perform the following operations.

**a**  $\frac{1}{6} + \frac{1}{3} - \frac{2}{9}$    **b**  $\frac{1}{6} \times \frac{3}{5} \div \frac{3}{10}$    **c**  $\left(\frac{3}{4} + \frac{5}{8}\right) \div \frac{24}{33}$    **d**  $\left(\frac{1}{5}\right)^2 \div \frac{3}{10}$

12.

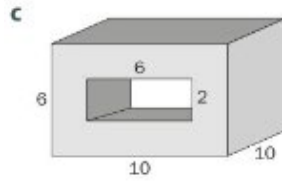
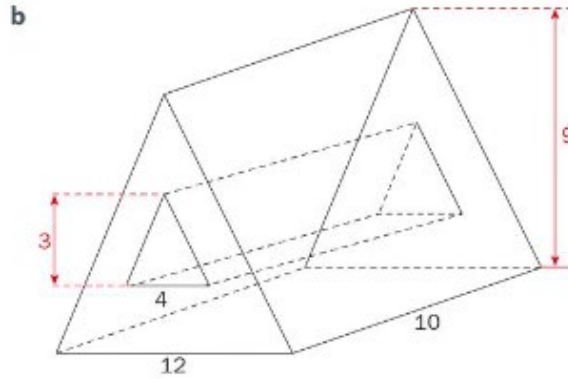
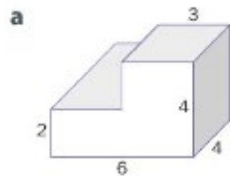
The following graph shows the favorite sports of students at an international school.



- a** What is the most popular sport?
- b** What sports are more popular with girls than boys?
- c** How many boys said golf was their favorite sport?
- d** How many students said tennis was their favorite sport?
- e** How many students were surveyed to collect this data? Explain.
- f** How many students had a favorite sport that was not listed as an option in this survey?
- g** Do you think it is acceptable to have a column for 'other'? Why or why not?
- h** Is this the most effective way to represent this data? Explain.

13.

Find the volume of these 3D shapes. All measurements are in feet.



14.

Tiny houses have become popular in the United States as a way of simplifying life, but also of being more ecologically friendly. With a living space of less than  $46 \text{ m}^2$ , tiny houses use less materials to build, require less energy and can be built on smaller amounts of land. The tiny houses below are two examples of designs from which customers can choose.



The house on the left has interior dimensions of  $2.5 \text{ m} \times 18 \text{ m} \times 2.8 \text{ m}$ .

The triangular house has base dimensions of  $4 \text{ m} \times 10 \text{ m}$ , maximum height of  $7 \text{ m}$  and slant height of  $7.3 \text{ m}$ .

- Find the amount of space inside each house.
- Compare the environmental impacts (positive and negative) of each house.
- If you were building a tiny house, which design would you select? **Explain.**