S2 Mathematics Practice Paper: Algebraic Expressions and Factorisation, Linear Equations and Inequalities, Percentages and Ratio, Area and Volume, Statistical Charts and Probability

Level: S2 | Subject: Mathematics | 60 minutes | 100 marks | 24 questions | question paper

Section A: Algebraic Expressions and Factorisation (18 marks)

Show all working steps and give suitable units in your answers.

#	Question	Marks
1	Expand and simplify $(3x - 2)(2x + 5) - 4x(x - 1)$, and state the coefficient of x^2, the coefficient of x and the constant term.	5
2	Factorise each of the following: (a) $6x^2 - 9x$ (b) $x^2 - 7x + 12$ (c) $4x^2 - 25$	5
3	Factorise $2x^2 + 7x + 3$, and factorise $x^2 + 10x + 25$ using the perfect square formula.	4
4	Simplify $(x^2 - 9) / (x^2 + x - 12)$ and state the values that x cannot take.	4

Section B: Linear Equations and Inequalities (17 marks)

Show all working steps and give suitable units in your answers.

#	Question	Marks
5	Solve the equation $5(x - 3) = 2x + 9$.	5
6	Solve the equation $(x + 1)/2 - (x - 3)/3 = 2$.	4
7	Solve the inequality $3 - 2x < 11$ and state the smallest integer solution.	4
8	The sum of three consecutive integers is 87. Find the three integers.	4

Section C: Percentages and Ratio (17 marks)

Show all working steps and give suitable units in your answers.

#	Question	Marks
9	The price of a toy is reduced from \$480 to \$420. Find the percentage decrease, correct to 0.1%.	5
10	An item costs \$250. The shopkeeper marks it up by 40% and later sells it at a 15% discount. Find the selling price and the percentage profit.	4
11	\$756 is shared among A, B and C in the ratio 2 : 3 : 4. Find the amount each receives.	4
12	8 workers need 12 days to finish a job. If the number of workers is reduced to 6 with the same efficiency, how many days are needed?	4

Section D: Area and Volume (16 marks)

Show all working steps and give suitable units in your answers.

#	Question	Marks

13	A circle has radius 7 cm. Taking π = 22/7, find its area and circumference.	4
14	A cylinder has radius 3 cm and height 10 cm. Find its volume and total surface area in terms of π.	4
15	A cone has radius 6 cm and height 8 cm. Find its slant height, volume and curved surface area in terms of π.	4
16	Two similar triangles have areas in the ratio 9 : 25. If the smaller triangle has perimeter 24 cm, find the perimeter of the larger triangle and the ratio of corresponding sides.	4

Section E: Statistical Charts (16 marks)

Show all working steps and give suitable units in your answers.

#	Question	Marks
17	Find the mean, median and mode of the data: 12, 15, 15, 18, 20, 25.	4
18	The test marks of 30 students are grouped as follows: 0-9 has 4 students, 10-19 has 8, 20-29 has 12 and 30-39 has 6. Estimate the mean mark using class mid-values, correct to 1 decimal place.	4
19	Of 120 students, 45 like football best. In a pie chart, what is the angle of the sector representing football?	4
20	In a class of 40, favourite sports are basketball 12, football 10, badminton 8 and others 10. Find the percentage for each category.	4

Section F: Probability (16 marks)

Show all working steps and give suitable units in your answers.

#	Question	Marks
21	Two fair dice are thrown together. Find the probability that the sum of the two numbers is 7.	4
22	A bag contains 5 red, 3 blue and 2 green balls. One ball is drawn at random. Find the probability that it is not red.	4
23	Using the bag in the previous question, one ball is drawn and not replaced, then a second ball is drawn. Find the probability that both balls are red.	4
24	Three fair coins are tossed together. Find the probability of getting at least one head.	4