S3 Maths Practice Paper: percentages and interest, similar figures, map scale and proportion, volume and surface area of solids, coordinates and straight lines, statistics and probability (100 marks)

Level: S3 | Subject: Maths | 75 minutes | 100 marks | 24 questions | question paper

Section A - Percentages and Interest (18 marks)

Answer all questions and show your working. (Round money answers to the nearest dollar or 2 decimal places.)

#	Question	Marks
1	A jacket is marked at $480. Its price is first reduced by 15%, then the reduced price is increased by 10%. Find (a) the final selling price; (b) the percentage change of the final price relative to the marked price.	5
2	A principal of $24,000 is deposited at 4% per annum simple interest for 3 years. Find (a) the interest earned; (b) the amount; (c) the amount if the interest were compounded yearly at the same rate (nearest dollar).	5
3	A class has 40 students and 45% of them are boys. Find (a) the number of boys and girls; (b) the percentage of girls in the class after 5 girls leave (correct to 0.1%).	4
4	The cost of an item is $320. The shop marks it up by 40% and then sells it at 20% off the marked price. Find (a) the selling price; (b) the percentage profit on cost.	4

Section B - Similar Figures and Proportion (18 marks)

Answer all questions and show your working.

#	Question	Marks
5	Two similar triangles have corresponding sides in the ratio 3 : 5. The smaller triangle has area 54 cm2 and perimeter 36 cm. Find (a) the area of the larger triangle; (b) its perimeter.	5
6	Two similar cylinders have radii in the ratio 2 : 3 (and the same ratio of heights). The larger cylinder has volume 405 cm3. Find (a) the volume of the smaller cylinder; (b) the ratio of their curved surface areas.	5
7	A map has a scale of 1 : 25,000. Find (a) the actual distance, in km, between two places 6.4 cm apart on the map; (b) the actual area, in km2, of a field shown as 12 cm2 on the map.	4
8	x varies directly as y, and y = 30 when x = 12. Find (a) y when x = 20; (b) if y varies inversely as z and z = 8 when y = 30, find y when z = 15.	4

Section C - Volume and Surface Area of Solids (16 marks)

Answer all questions and show your working.

#	Question	Marks
9	A cylinder has radius 7 cm and height 20 cm. Taking pi = 22/7, find (a) its volume; (b) its total surface area.	4

10	A cone has base radius 6 cm and slant height 10 cm. Taking pi = 3.14, find (a) its height; (b) its volume; (c) its curved surface area.	4
11	A sphere has radius 3 cm. Taking pi = 3.14, find (a) its volume; (b) its surface area. Give answers to 3 significant figures.	4
12	A solid metal sphere of radius 3 cm is melted and recast into small spheres of radius 1.5 cm, with no loss. How many small spheres can be made?	4

Section D - Coordinates and Equations of Straight Lines (16 marks)

Answer all questions and show your working.

#	Question	Marks
13	Given A(-2, 3) and B(4, -5), find (a) the length of AB; (b) the coordinates of the mid-point of AB.	4
14	Find the equation of the straight line passing through (2, 5) with slope 3, and find its x-intercept.	4
15	The line L has equation 2x + 3y = 12. Find (a) the slope of L; (b) its y-intercept; (c) whether the point (6, 0) lies on L.	4
16	The lines y = 2x + 1 and y = -x + 10 meet at P. Find (a) the coordinates of P; (b) the area of the triangle formed by the two lines and the x-axis.	4

Section E - Statistics (18 marks)

Answer all questions and show your working.

#	Question	Marks
17	The data are 4, 7, 7, 9, 11, 13, 16. Find (a) the mean (correct to 3 significant figures); (b) the median; (c) the mode; (d) the range.	5
18	The mean mark of 30 students is 62. The 18 boys have mean mark 58. Find the mean mark of the girls.	4
19	The grouped reading times (minutes) of 20 students are: 0 to under 10: 4; 10 to under 20: 7; 20 to under 30: 6; 30 to under 40: 3. Find (a) the modal class; (b) the class containing the median; (c) the estimated mean using class mid-points.	5
20	Ten numbers have mean 15. A new number 27 is added. Find the mean of the new set (correct to 2 decimal places).	4

Section F - Probability (14 marks)

Answer all questions and show your working or reasoning.

#	Question	Marks
21	A bag contains 5 red, 3 blue and 2 green balls. One ball is drawn at random. Find (a) P(red); (b) P(not blue); (c) P(green or blue).	4
22	Two fair dice are thrown together. Find the probability that (a) the sum is 7; (b) the sum is 12.	3
23	In a city the probability of rain on a day is 0.3. If it rains the probability a student is late is 0.4; if it does not rain the probability is 0.1. Find (a) P(rain and late); (b) P(late).	4
24	Two students are chosen at random from 4 boys and 3 girls. Find the probability that (a) both are girls; (b) at least one is a boy.	3

TutorZone - original practice paper. Time allowed: 75 minutes. Total: 100 marks.