

IGCSE 數學 0580 Paper 3

IGCSE (Core) 數學 | 時限：120 分鐘 | 總分：104 分 | 共 51 題

甲部：數字 (26 分)

全部作答，可使用計算機。

1. Work out 3.6×2.5 .

答案： $3 \times 2.5 = 7.5$ and $0.6 \times 2.5 = 1.5$, so $7.5 + 1.5 = 9$

2. A concert ticket costs \$480. The price then increases by 15%. Work out the new price.

答案： 15% of \$480 = \$72, so $\$480 + \$72 = \$552$

3. A car travels 156 km in 2.4 hours. Work out its average speed in km/h.

答案： $156 / 2.4 = 65$ km/h

4. Convert 4 500 mm to metres.

答案： $1 \text{ m} = 1\,000 \text{ mm}$, so $4\,500 / 1\,000 = 4.5$ m

5. Write 0.625 as a fraction in its simplest form.

答案： $625/1000 = 5/8$

6. Find 35% of 260.

答案： 10% = 26, 30% = 78, 5% = 13, so 35% = 91

7. Share \$560 in the ratio 3 : 4 : 7.

答案： $3 + 4 + 7 = 14$ parts, $\$560 / 14 = \40 , so \$120, \$160 and \$280

8. Work out $2.7^2 - 1.44$.

答案： $2.7 \times 2.7 = 7.29$, then $7.29 - 1.44 = 5.85$

9. Write 3.6472 correct to 3 significant figures.

答案： The 4th significant figure is 7, so round up: 3.65

10. In a sale a bag costing \$240 is reduced by 20%. Work out the sale price.

答案： 20% of \$240 = \$48, so $\$240 - \$48 = \$192$

11. Write 0.00042 in standard form.

答案： $0.00042 = 4.2 \times 10^{-4}$

12. Find the lowest common multiple (LCM) of 24 and 36.

答案： $24 = 2^3 \times 3$ and $36 = 2^2 \times 3^2$, so $\text{LCM} = 2^3 \times 3^2 = 72$

13. Work out $\frac{3}{4} \times \frac{2}{9}$. Give your answer in its simplest form.

答案： $\frac{3}{4} \times \frac{2}{9} = \frac{6}{36} = \frac{1}{6}$

14. A recipe for 6 people needs 450 g of flour. Work out the amount of flour needed for 15 people.

答案 : $450 \div 6 = 75$ g per person, and $75 \times 15 = 1125$ g

15. \$2 000 is invested at 4.5% simple interest per year. Work out the interest after 3 years.

答案 : $2\,000 \times 0.045 \times 3 = \270

16. A map has a scale of 1 : 50 000. A road is 7.2 cm long on the map. Work out the real length of the road in kilometres.

答案 : $7.2 \times 50\,000 = 360\,000$ cm = 3.6 km

乙部：代數 (26 分)

化簡及解方程，須列出步驟。

17. Simplify $7x - 3y + 2x + 5y$.

答案 : $7x + 2x = 9x$ and $-3y + 5y = 2y$, so $9x + 2y$

18. Expand $4(3x - 2)$.

答案 : $4 \times 3x = 12x$ and $4 \times (-2) = -8$, so $12x - 8$

19. Factorise $6x + 9y$.

答案 : The highest common factor is 3, so $3(2x + 3y)$

20. Solve $5x - 8 = 42$.

答案 : $5x = 42 + 8 = 50$, so $x = 10$

21. Solve $3(x + 4) = 2x + 19$.

答案 : $3x + 12 = 2x + 19$, so $x = 19 - 12 = 7$

22. The first four terms of a sequence are 5, 8, 11, 14. (a) Find the 20th term. (b) Write down an expression for the n th term.

答案 : (a) The difference is 3, so the 20th term is $3 \times 20 + 2 = 62$. (b) n th term = $3n + 2$

23. $v = u + at$. Work out v when $u = 12$, $a = 3.5$ and $t = 8$.

答案 : $3.5 \times 8 = 28$, so $v = 12 + 28 = 40$

24. Make t the subject of the formula $s = (u + v)t / 2$.

答案 : $2s = (u + v)t$, so $t = 2s / (u + v)$

25. Work out the value of y when $x = -2$, given $y = 3x^2 - 2x$.

答案 : $3 \times 4 = 12$ and $-2 \times (-2) = +4$, so $y = 12 + 4 = 16$

26. Solve $x^2 = 49$.

答案 : Taking the square root gives $x = 7$ or $x = -7$

27. Expand and simplify $(x + 5)(x - 3)$.

答案 : $x^2 - 3x + 5x - 15 = x^2 + 2x - 15$

28. Solve the inequality $4x + 3 \leq 27$.

答案 : $4x \leq 24$, so $x \leq 6$

丙部：圖形與空間（30 分）

圖形未必按比例綑畫。

29. Work out the sum of the interior angles of a hexagon.

答案 : $(6 - 2) \times 180^\circ = 720^\circ$

30. Work out the size of each exterior angle of a regular octagon.

答案 : $360^\circ / 8 = 45^\circ$

31. A circle has radius 7.5 cm. Work out its area. Use $\pi = 3.142$.

答案 : $3.142 \times 7.5 \times 7.5 = 176.7 \text{ cm}^2$

32. A cylinder has radius 4 cm and height 10 cm. Work out its volume. Use $\pi = 3.142$.

答案 : $3.142 \times 16 \times 10 = 502.72 \text{ cm}^3$

33. A prism has a constant cross-section of area 12 cm^2 and a length of 15 cm. Work out its volume.

答案 : $12 \times 15 = 180 \text{ cm}^3$

34. A shape is enlarged by scale factor 2.5. Work out the area scale factor.

答案 : $2.5 \times 2.5 = 6.25$

35. Two triangles are similar. The smaller triangle has area 20 cm^2 and the smaller of two corresponding sides is 6 cm. The larger corresponding side is 9 cm. Work out the area of the larger triangle.

答案 : Length factor $9/6 = 1.5$, so area factor $1.5^2 = 2.25$, and $20 \times 2.25 = 45.0 \text{ cm}^2$

36. A right-angled triangle has two shorter sides of length 9 cm and 12 cm. Work out the length of the hypotenuse.

答案 : $9^2 + 12^2 = 81 + 144 = 225$, and the square root of 225 is 15.0 cm

37. In a right-angled triangle the hypotenuse is 13 cm and the side opposite angle θ is 5 cm. Work out the size of angle θ , correct to 1 decimal place.

答案 : $\sin\theta = 5/13 = 0.3846$, so $\theta = 22.6^\circ$

38. A ship sails on a bearing of 065° . It then turns 130° clockwise. Write down its new bearing.

答案 : $65 + 130 = 195^\circ$

39. A trapezium has parallel sides of length 8 cm and 14 cm and a height of 6 cm. Work out its area.

答案 : $(8 + 14) / 2 = 11$, and $11 \times 6 = 66.0 \text{ cm}^2$

40. A sector of a circle has radius 9 cm and angle 140° . Work out the length of its arc. Use $\pi = 3.142$.

答案 : $140/360 \times 2 \times 3.142 \times 9 = 21.99 \text{ cm}$

41. A sphere has radius 3 cm. Work out its volume. Use $\pi = 3.142$.

答案 : $4/3 \times 3.142 \times 27 = 113.112 \text{ cm}^3$

丁部：數據與概率（22 分）

概率以最簡分數作答。

42. The number of goals scored in five matches were 14, 18, 9, 21 and 13. Work out the mean.

答案： $(14 + 18 + 9 + 21 + 13) / 5 = 75 / 5 = 15$

43. Here are seven test scores: 4, 6, 6, 8, 11, 13, 15. Write down (a) the median, (b) the mode, (c) the range.

答案： (a) the middle value is 8 (b) mode = 6 (c) $15 - 4 = 11$

44. A bag contains 3 red, 5 green and 4 blue counters. One counter is taken at random. Work out the probability that it is not blue.

答案： 8 of the 12 counters are not blue, so $P = 8/12 = 2/3$

45. A fair dice is rolled once. Work out the probability of scoring more than 4.

答案： The scores 5 and 6 work, so $P = 2/6 = 1/3$

46. In a pie chart 36 out of 90 students chose football. Work out the angle of that sector.

答案： $36/90 \times 360^\circ = 144.0^\circ$

47. A spinner landed on 6 forty-six times in 200 spins. (a) Estimate the probability of landing on 6. (b) Work out how many times it is expected to land on 6 in 500 spins.

答案： (a) $46/200 = 0.23$ (b) $0.23 \times 500 = 115$

48. Two independent events have probabilities 0.4 and 0.5. Work out the probability that both events happen.

答案： $0.4 \times 0.5 = 0.2$

49. The mean of five numbers is 12. Four of the numbers are 9, 14, 11 and 13. Find the fifth number.

答案： Total = $5 \times 12 = 60$, and $60 - 47 = 13$

50. The probability that a train is late is 0.62. Work out the probability that it is not late.

答案： $1 - 0.62 = 0.38$

51. The smallest value in a data set is 3.2 and the largest value is 9.8. Write down the range.

答案： $9.8 - 3.2 = 6.6$