

IGCSE 數學 0580 Paper 2

IGCSE (Extended) 數學 | 時限：90 分鐘 | 總分：70 分 | 共 20 題

甲部 數字與代數 (28 分)

全部題目必須作答，須展示計算步驟。

1. Expand and simplify $5(2x - 3) - 2(x - 4)$.

答案： $10x - 15 - 2x + 8 = 8x - 7$

2. Solve $3x + 7 = 4x - 5$.

答案： $3x + 7 = 4x - 5$ gives $x = 12$; check $3 \times 12 + 7 = 43 = 4 \times 12 - 5$

3. In a sale a jacket is reduced by 15 per cent and now costs \$680. Work out the original price.

答案： $680 \div 0.85 = \$800$

4. Expand and simplify $(x + 6)(x - 4)$.

答案： $x^2 + 2x - 24$

5. Factorise completely $6x^2 + 15x$.

答案： $3x(2x + 5)$

6. y is directly proportional to x^2 . When $x = 7$, $y = 98$. Find y when $x = 11$.

答案： $k = 98 \div 49 = 2$, so $y = 2 \times 121 = 242$

7. Work out $(4.2 \times 10^5) \times (3.5 \times 10^{-3})$, giving your answer in standard form.

答案： $14.7 \times 10^2 = 1.47 \times 10^3$

8. \$4,500 is invested at 3.2 per cent per year compound interest. Find the value after 3 years, to the nearest cent.

答案： $4500 \times 1.032^3 = \$4,945.97$

9. Simplify $(x^2 - 9) \div (x^2 + x - 12)$.

答案： $(x - 3)(x + 3) \div (x - 3)(x + 4) = (x + 3)/(x + 4)$ for $x \neq 3$

乙部 圖形與空間 (23 分)

如無特別說明，答案須附單位。

10. A right-angled triangle has legs 9 cm and 12 cm. Work out the length of the hypotenuse and the area of the triangle.

答案：hypotenuse = $\sqrt{(81 + 144)} = 15$ cm; area = $\frac{1}{2} \times 9 \times 12 = 54$ cm²

11. A sector of a circle of radius 7 cm has angle 120° . Using $\pi = 3.142$, work out the arc length.

答案： $120/360 \times 2 \times 3.142 \times 7 = 14.66$ cm

12. A cone has base radius 6 cm and height 10 cm. Using $\pi = 3.142$, work out its volume.

答案 : $\frac{1}{3} \times 3.142 \times 36 \times 10 = 377.04 \text{ cm}^3$

13. Two triangles are similar. The area of the smaller is 50 cm^2 and the ratio of corresponding lengths is 5 : 7. Find the area of the larger triangle.

答案 : $50 \times 49 \div 25 = 98 \text{ cm}^2$

14. A ladder 6.5 m long leans against a vertical wall with its foot 2.5 m from the wall. Work out the height reached and the angle the ladder makes with the ground.

答案 : height = $\sqrt{(42.25 - 6.25)} = 6.0 \text{ m}$; angle = $\cos^{-1}(2.5 \div 6.5) = 67.4^\circ$

15. Work out the interior angle of a regular 12-sided polygon.

答案 : $(12 - 2) \times 180 \div 12 = 150^\circ$

丙部 數據與概率 (19 分)

概率可用分數或小數作答。

16. Five test scores are 12, 15, 9, 18 and 21. Work out the mean score.

答案 : total $75 \div 5 = 15$

17. The ages of 10 club members are 3, 5, 7, 8, 8, 10, 12, 14, 15 and 18. Work out the median age.

答案 : median = $(8 + 10) \div 2 = 9$

18. A bag holds 5 red, 3 blue and 2 green counters. One counter is taken at random. (a) Work out the probability that it is not red. (b) Two counters are then taken without replacement; work out the probability that both are red.

答案 : (a) 5 of the 10 counters are not red, so $1/2$. (b) $5/10 \times 4/9 = 2/9 \approx 0.222$

19. A scatter graph of 20 students plots height against shoe size, with the points rising from left to right. Describe the correlation and say what it means.

答案 : Positive correlation: taller students tend to have larger shoe sizes

20. The probability that a component is faulty is 0.04. In a batch of 500 components, work out the expected number of faulty components.

答案 : $500 \times 0.04 = 20$