FREE PRACTICE EXAM

Edexcel IAL P1 Pure Mathematics 1 Practice Exam

Pearson Edexcel International A Level Mathematics · 22 questions · 60 marks

Name _____ Date _____ Score / 60

- Answer every question. Show your working: most marks are for method.
- Calculator allowed.
- Topics: Algebraic expressions and indices; Quadratic functions and graphs; The discriminant; Graph transformations; Differentiating polynomials; Differentiation from first principles; Integration of polynomials; Radian measure, arc and sector; Trig ratios and graphs; Sine and cosine rules, area of a triangle; Simultaneous equations; Coordinate geometry; Sketching polynomial graphs; Tangents and normals.
- The mark scheme is a separate free PDF: alevelmathrevision.com/alevel-frontend/downloads/practice-exams/ial/edexcel-ial-p1-pure-mathematics-1-practice-exam-mark-scheme.pdf

1. Evaluate $16^{-\frac{1}{4}}$ without using a calculator. **[2]**

2. Solve the equation $3x^2 - 10x - 8 = 0$. **[2]**

3. Find the possible values of k for which the equation $x^2 + kx + 9 = 0$ has equal roots. **[2]**

4. The line L_1 has equation $y = 2x + 3$. The line L_2 is a reflection of L_1 in the y-axis. Write down the equation of L_2. **[2]**

5. Differentiate $y = 4\sqrt{x}$ with respect to x. **[2]**

6. Calculate the gradient of the chord on the curve $y = x^3$ between the points where $x = 1$ and $x = 1.1$. **[2]**

7. Given that $\int (kx^2 - 4x)\,dx = \frac{5}{3}x^3 - 2x^2 + c$, find the value of the constant k. **[2]**

8. A minor arc of a circle with radius 20 cm has a length of 8π cm. Find the exact angle subtended by the arc at the centre in radians. **[2]**

9. Find the maximum value of the function $y = 8 - 3\cos x$. **[2]**

10. In triangle PQR, $PQ = 5$ cm, $QR = 5$ cm, and $PR = 6$ cm. Find the exact value of $\cos Q$. **[2]**

11. Solve the simultaneous equations: **[3]**

$4x - 3y = 17$

$2x + y = 11$

12. Find the gradient of the perpendicular bisector of the line segment joining the points $(1, 1)$ and $(5, 9)$. **[3]**

13. Find the coordinates of the points where the curve $y = x^3 - 9x$ intersects the x-axis. **[3]**

14. Evaluate $\left(\frac{25}{9}\right)^{-\frac{3}{2}}$ without using a calculator. **[3]**

15. A quadratic curve has the equation $y = ax^2 + bx + c$. The curve crosses the x-axis at $x = 1$ and $x = 5$, and crosses the y-axis at $(0, -5)$. Find the values of a, b, and c. **[3]**

16. A straight line passes through the points $(p, 1)$ and $(2p, 5)$ and has a gradient of 4. Find the value of p. **[3]**

17. Find $\frac{dy}{dx}$ when $y = \frac{(x-2)(x+4)}{x^2}$. **[3]**

18. The minimum turning point of the curve $y = x^2 - 4x + 7$ is at $(2, 3)$. Find the coordinates of the minimum turning point of the curve $y = (x + 1)^2 - 4(x + 1) + 7$. **[3]**

19. A chord subtends an angle of 1.6 radians at the centre of a circle of radius 9 cm. Calculate the area of the minor segment bounded by this chord, to 1 decimal place. **[3]**

20. The normal to the curve $y = \frac{1}{x}$ has a gradient of $\frac{1}{4}$. Find the possible coordinates of the point on the curve where this normal is drawn. **[4]**

21. Find $\int \frac{x^2+4}{\sqrt{x}}\, dx$. **[4]**

22. Solve the simultaneous equations: **[5]**

$x^2 + y^2 = 10$

$x + 2y = 5$

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