

14. Show that the points $(0, 0)$, $(5, \pi/8)$, $(5, 7\pi/8)$ form an equilateral triangle.

15. Evaluate $\int \frac{1}{a \sin x + b \cos x} dx$.

16. Solve $(xy^2 + x) dx + (yx^2 + y) dy = 0$.

17. Solve $(1 + x^2) \frac{dy}{dx} + 2xy - 4x^2 = 0$.

SECTION - C

5 × 7 = 35

LONG ANSWER TYPE QUESTIONS

Attempt **any 5** questions. Each question carries **7** marks.

18. If $y = \sin(m \sin^{-1} x)$ then show that $(y_{n+2})_0 = (n^2 - m^2)(y_n)_0$.

19. Show that the condition that the pair of tangents drawn to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ from (g, f) may be right angles is $g^2 + f^2 + c = 0$.

20. Find the equation to the circle whose diameter is the common chord of the circles $x^2 + y^2 + 2x + 3y + 1 = 0$, $x^2 + y^2 + 4x + 3y + 2 = 0$. Find also the length of the common chord.

21. Show that the equation of a hyperbola in the standard form is $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$.

22. Evaluate $\int \frac{2x+5}{\sqrt{x^2-2x+10}} dx$.

23. Evaluate $\int_0^{\pi} \frac{x \sin x}{1 + \sin x} dx$.

24. Find the area enclosed between the curve $y = x^2 - 5x$, $y = 4 - 2x$.