

Answer on Question #47132 – Math - Calculus

Trace the following curves

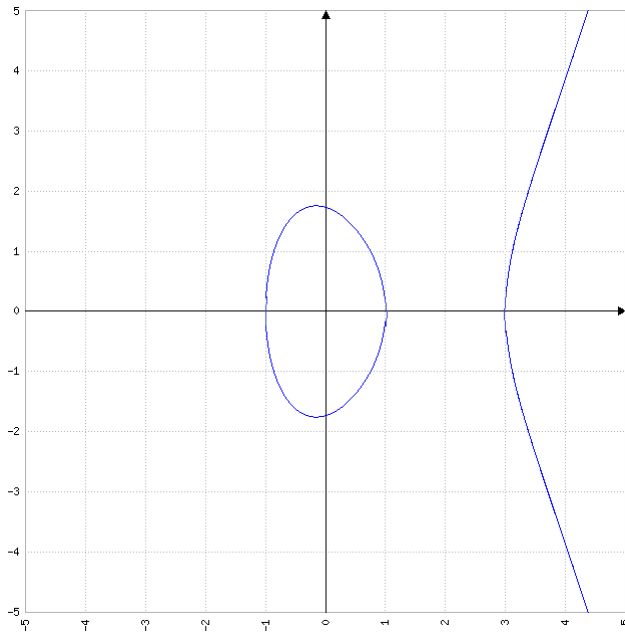
1) y^2 equal To $(x-1)(x+1)(x-3)$

2) $y^2(x-a)$ equal to $x^2(x+a)$; a is greater than 0

Solution.

1) $y^2 = (x - 1)(x + 1)(x - 3)$

- x – intercepts: $y = 0 \rightarrow (x - 1)(x + 1)(x - 3) = 0 \rightarrow x = -1, x = 1, x = 3.$
- y – intercepts: $x = 0 \rightarrow y^2 = 3 \rightarrow y = -\sqrt{3}, y = \sqrt{3}.$
- the exponent of y is always even in the equation of the curve then the x -axis is an axis of symmetry for the curve.
- $y^2 \geq 0$, so $(x - 1)(x + 1)(x - 3) \geq 0 \rightarrow -1 \leq x \leq 1$ or $x \geq 3.$
- when $x \rightarrow \infty$, y behaves as $\pm x^{\frac{3}{2}}.$



2) $y^2(x - a) = x^2(x + a)$, $a > 0$

- x - intercepts: $y = 0 \rightarrow x^2(x + a) = 0 \rightarrow x = -a, x = 0$.
- y - intercepts: $x = 0 \rightarrow y = 0$.
- the exponent of y is always even in the equation of the curve then the x -axis is an axis of symmetry for the curve.
- vertical asymptote $x = a$.
- $y^2 \geq 0$, so $\frac{x+a}{x-a} \geq 0 \rightarrow x > a$ or $x \leq -a$.
- when $x \rightarrow \infty$, y behaves as $\pm x$.

