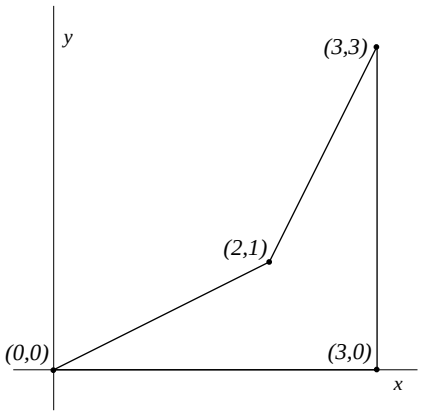
640:251:01-03 **Another Quiz** **4/2/97**

1. Find all critical points of $P(x, y) = \left(x^2 + y^2 - 1\right)^2$.

2. Suppose $\mathcal{R}$ is the region shown (bounded by four straight line segments) and $H(x, y)$ is an unknown function. Write $\iint_{\mathcal{R}} H(x, y)\, dA$ as a sum of one or more iterated integrals.



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3. Compute: $\displaystyle\int_0^\infty \int_0^\infty \frac{1}{\left(1+x^2+y^2\right)^2}\, dx\, dy.$

4. Compute: $\displaystyle\int_0^1 \int_0^x \int_0^{xy} z\; dz\, dy\, dx.$