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Ayla R. Gafni* (gafni@math.psu.edu). *Counting rational points near planar curves.*

We give an explicit asymptotic formula for the number of rational points near planar curves. More precisely, let $f : [\eta, \xi] \rightarrow \mathbb{R}$ have a continuous second derivative that is bounded away from 0 on $[\eta, \xi]$. For $Q \geq 1$ and $0 < \delta < 1/2$, define $N(Q, \delta)$ to be the number of rational points $(a/q, b/q) \in \mathbb{R}^2$ with $q \leq Q$, which lie in a δ -neighborhood of the curve graphing f . We provide an asymptotic formula for $N(Q, \delta)$, and show, under mild conditions on f , that

$$N(Q, \delta) \sim (\xi - \eta)\delta Q^2.$$

This result is relevant to the expansion of Khinchin Theory. If time permits, we will give a brief overview of Khinchin's theorem and its generalizations, and explain how this new result fits into the broader theory of metric Diophantine approximation. (Received September 09, 2013)