On zeta functions of categories

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We consider possible ways to attach some kind of zeta functions to categories. At present, three different definitions were suggested.

(1) Kazunori Noguchi (Documenta Mathematica 18, pp. 1243–1274, 2013) defines zeta functions of finite categories. These zeta functions are somewhat similar to that of varieties over finite fields.

(2) Nobushige Kurokawa (Proc. Japan Acad., Ser. A, **60**, 1984, No. 9, pp. 335–338; **72**, 1996, No. 10, pp. 221–222) defines zeta functions of categories by means of the Euler products those local factors are similar to that of the Riemann zeta function.

(3) One more definition is given recently by the author (Zap. nauchn. seminarov POMI, **449**, pp. 230-234, 2016). From our viewpoint, we can define zeta functions of categories by means of Dirichlet series and we should not state form of local factors and existence of the Euler products just in the definition.

We intend to look in details on these definitions, to state basic properties of the zeta functions, and to give some samples.

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