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**Practice Reductions**

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Reduce each of the following expressions to their normal forms. Answers are given on the reverse of this sheet.

1.  $(\lambda x.x)(\lambda x.xx)(\lambda x.xa)$

2.  $(\lambda x.x)(\lambda y.yy)(\lambda z.za)$

3.  $(\lambda x.\lambda y.xyy)(\lambda a.a)b$

4.  $(\lambda x.xx)(\lambda y.yx)z$

5.  $(\lambda x.(\lambda y.(xy))y)z$

**1.** *aa*

**2.** *aa*

**3.** *bb*

**4.** *xxz*

**5.** *zy*