SOAR Math Course | Contest! | Winter, 2002

Each of the following groups is a familiar group in disguise. Figure out what groups these are! Win fame and prizes! Email answers to `garfield@math.toronto.edu` by midnight on the evening of December 16th. Some kind of proof is nice, but only required if you submitted the problem. Wrong answers may count against you.

1. $G_1 = \langle a, b, c, d \mid a^2 = d,\ b^2 = d^{-2},\ c^2 = ba^2b,\ d^3ab = c,\ a^2b^2 = d^3cb^{-1}a^{-1} \rangle$

2. $G_2 = \langle a, b \mid a^3 = 1,\ b^7 = 1,\ a^2b = b^3a^2 \rangle$

3. $G_3 = \langle a, b, c \mid a^5 = 1,\ b^{11} = 1,\ c^3 = 1,\ a^4b = b^2a^4,\ b^{10}c = c^2b^{10},\ ac = ca^4 \rangle$

4. $$G_4 = \left\langle a, b, c, d, e, f, g, h \;\middle|\; \begin{array}{l} a^3 = c^6 = b,\ ca = be^2,\ d^2a^3 = h,\ h^2 = b = f^2, \\ da = gb, da^2da = c,\ e^2f = d^2,\ ca^2 = h, \\ c^a = f,\ da^2 = b^2e,\ d^2a = c, da = g \end{array} \right\rangle$$

5. $G_5 = \langle x, y, z \mid x^2 = 1,\ y^4 = 1,\ z^2 = 1,\ y^2z = 1,\ xyxy = 1, xy^{-1}zxy = 1 \rangle$