Correction

Correction to: A Fully Pexiderized Variant of d'Alembert's Functional Equations on Monoids

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Correction to: Results Math

<https://doi.org/10.1007/s00025-020-01335-9>

Some errors in the above-named article need to be corrected. The most serious error occurs in Lemma 4.1, where some solutions were omitted. The mistake comes from the claim in the proof that $c = 1/2$ (near the bottom of p.7), which is false. In fact after renaming c as c/a we get the following for part (i) of Lemma 4.1: For $\chi \circ \sigma \neq \chi$,

$$f = \theta + bc(\chi + \chi \circ \sigma) + \frac{ab}{2}(\chi - \chi \circ \sigma),$$

$$g = -\theta - bc(\chi + \chi \circ \sigma) + \frac{ab}{2}(\chi - \chi \circ \sigma),$$

$$h = b(\chi - \chi \circ \sigma), \quad \text{and} \quad k = \frac{a}{2}(\chi + \chi \circ \sigma) + c(\chi - \chi \circ \sigma).$$

It can be checked that functions of such forms satisfy all the conditions of Lemma 4.1.

Also the reader should take $\mathbb{K} = \mathbb{C}$ throughout the paper, so f_σ is central in Lemma 4.4 and Theorem 4.6.

In Lemma 4.3, solution family (i) should state “For $\chi \neq \chi \circ \sigma$,” since it arose under this condition in the proof. (In fact if $\chi = \chi \circ \sigma$ then the forms in (i) are contained in (ii).)

The original article can be found online at <https://doi.org/10.1007/s00025-020-01335-9>.

The statement of Theorem 4.6 is correct, but part of the proof must be changed due to the mistake in Lemma 4.1. In the case $h \neq 0$, $k \neq 0$, $k(e) \neq 0$, and $h(e) = 0$, solution (i) of Lemma 4.1 is solution (c) of Theorem 4.6 with $a_1 = bc = -b_1$, $a_2 = b_2 = ab/2$, $c_1 = 0$, $c_2 = b$, $d_1 = a/2$, and $d_2 = c$. It should also be noted that part (e) of Theorem 4.6 can be omitted, since it is contained in part (d) with $c_2 = d_2 = 0$ (and a change of notation) because $\chi \in \mathcal{N}(S, \sigma)$ when $\chi = \chi \circ \sigma$.

There are small misprints on page 7, where $(1/2)f_o = f - f \circ \sigma$ should be $2f_o = f - f \circ \sigma$, and on page 11 where the displayed equation three lines above **Case 2** should end “ $= -(a/4b)[A^2(xy)\chi(xy) - A^2(\sigma(y)x)\chi(\sigma(y)x)]$ ” instead of as printed.

The final remark is that in [1] Wilson studied the functional equation

$$f(x+y) + g(x-y) = h(x)k(y),$$

which encompasses both d’Alembert equations. Our principal functional equation is a variant of this for monoids.

References

- [1] Wilson, W.H.: Two general functional equations. Bull. Am. Math. Soc. **31**, 330–334 (1925)

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