

For example, factoring $2x^2 - 7x - 4$. The graph of $y = 2x^2 - 7x - 4$ is shown in Figure 4. The roots occur at $-1/2$ and $+4$. The factors are $(x - (-1/2))(x - (+4)) = (x + 1/2)(x - 4) \neq 2x^2 - 7x - 4$. However, if we clear $(x + 1/2)$ of the fraction by multiplying by 2, we get $2(x + 1/2) = (2x + 1)$. Substituting this for $(x + 1/2)$ gives $(2x + 1)(x - 4) = 2x^2 - 7x - 4$. It is appropriate to multiply through by 2 (or any number) since the roots occur at $y = 0$. In fact, we are multiplying both sides of the equation $(x + 1/2)(x - 4) = 0$ by 2.

Graphing also helps students understand why some expressions do not factor – because they do not have x-intercepts. For example, $x^2 + 2x + 2$. Examining the graph of $y = x^2 + 2x + 2$ (Figure 5) shows that the function is located entirely above the x-axis, has no x-intercepts, and does not factor.

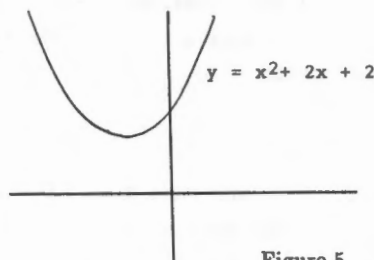


Figure 5

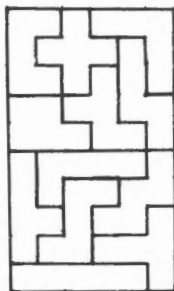
The graphic approach to factoring is not meant to replace all of the old techniques. The factoring rules, guess methods, and quadratic formula still have their place. The graphic approach is taught to add clarity to the process.

Conclusion

The introduction of low cost graphing software and hand-held graphing calculators invites many new approaches to old mathematics. The key is to allow the technology to help us find ways to reinforce mathematical concepts. Factoring is the one area that is greatly aided by the use of graphing. Students learn in depth concepts relating the abstract equation or expression to a concrete picture – the graph.

MORE PENTOMINOES

College Corner 5th graders reported 60 solutions to their pentomino puzzle in the Summer, 1989 issue of this Journal. That class, this year's 5th graders, and puzzling readers have boosted the total to 215! One of Christy's is shown. If you have solutions send them to Bethel Hooven, Union School, College Corner, OH 45003.



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