

Study Guide

Perfect Squares and Factoring

Perfect Square Trinomials	$(a + b)^2 = a^2 + 2ab + b^2$ $(a - b)^2 = a^2 - 2ab + b^2$
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To factor a perfect square trinomial, the first and last terms must be perfect squares, and the middle term must be twice the product of the square roots of the first and last terms.

Example: Factor $m^2 + 26m + 169$.

$$\begin{aligned} m^2 + 26m + 169 &= (m)^2 + 2(m)(13) + (13)^2 \\ &= (m + 13)^2 \end{aligned}$$

To determine whether a trinomial in mixed order is a perfect square, first arrange the terms in order of descending powers.

Determine whether each trinomial is a perfect square trinomial. If so, factor it.

1. $y^2 + 10y + 25$

2. $m^2 - 14mn + 49n$

3. $p^2 + 8p + 64$

Factor each polynomial, if possible. If the polynomial cannot be factored, write prime.

4. $16x^2 + 48x + 36$

5. $49a^4 - 112a^2b^2 + 64b^4$

6. $x^2y^2 - 6abxy + 9a^2b^2$

7. $81 + 18xy + x^2y^2$

8. $25x^2 - 10x - 1$

9. $169 - 26r + r^2$

10. $7x^2 - 9x + 2$

11. $a^2 + 22a + 121$

12. $9x^2 - 12x + 4$

13. $x^2 - 9x - 81$

14. $49b^2 - 126ab + 81a^2$

15. $144 + 24x + x^2$

16. $256 - 16b + b^2$

17. $361 - 38x + x^2$

18. $16a^2 - 40ab + 25b^2$

19. $36x^2 - 12x + 1$

20. $9x^2 + 66x + 121y^2$

21. $4a^2 - 20a + 25$