

Worksheet 1: Calculate the discriminant and use it to tell whether or not the trinomial factors. Factor those that do.

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|----------------------|----------------------|----------------------|----------------------|------------------------|
| 1. $x^2 - 2x + 5$ | 2. $x^2 - 2x - 29$ | 3. $x^2 - 21x + 68$ | 4. $x^2 - 10x + 74$ | 5. $18x^2 - 15x + 2$ |
| 6. $3x^2 - 15x + 14$ | 7. $18x^2 - 13x + 3$ | 8. $3x^2 - 16x + 13$ | 9. $8x^2 - 79x - 10$ | 10. $48x^2 - 22x - 15$ |

Factor each polynomial completely. They are arranged in no particular order, so you must decide which technique to use.

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|---------------------------------------|------------------------|--------------------------|---------------------------|-----------------------|
| 11. $4x^2 - 16y^2$ | 12. $a^2b^4 - a^4b^2$ | 13. $4x^2 - 12xy + 9y^2$ | 14. $x^2 + 11x + 18$ | 15. $a^2 + 3a - 88$ |
| 16. $30x^2 + 95x + 50$ | 17. $2x^2 + xy - 3y^2$ | 18. $7x^4 - 28x^2$ | 19. $x^4 - x^2 - 12$ | 20. $15x^2 + 8x - 12$ |
| 21. $60x^2 - 68x + 8$ | 22. $x^4 - 26x^2 + 25$ | 23. $16x^2 - 35x + 6$ | 24. $81x^2 + 108x + 36$ | 25. $x^2 + 3x + 4$ |
| 26. $(2x + 3y + a)^2 - (x - y + a)^2$ | 27. $100 - (x - y)^2$ | 28. $x^2 - 2x - 7$ | 29. $35a^2 + 47ab + 6b^2$ | |
| 30. $343 - 7(x + 3)^2$ | | | | |

Answers to odd problems:

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|-----------------------------|--------------------------------|---------------------------|-------------------------|
| 1. -16; does not factor | 3. 169; $(x - 17)(x - 4)$ | 5. 81; $(3x - 2)(6x - 1)$ | 7. -47; does not factor |
| 9. 6561; $(8x + 1)(x - 10)$ | 11. $4(x + 2y)(x - 2y)$ | 13. $(2x - 3y)^2$ | 15. $(a + 11)(a - 8)$ |
| 17. $(x - y)(2x + 3y)$ | 19. $(x^2 + 3)(x + 2)(x - 2)$ | 21. $4(15x - 2)(x - 1)$ | 23. $(x - 2)(16x - 3)$ |
| 25. prime | 27. $(10 + x - y)(10 - x + y)$ | 29. $(7a + b)(5a + 6b)$ | |

Worksheet 2: Factor each polynomial completely.

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| 1. $x^2 + 10x + 25$ | 2. $64x^2 + 16x + 1$ | 3. $4a^2 - 36ab + 81b^2$ | 4. $x^2 - 2xy + y^2$ | 5. $20rs - r^2 - 100s^2$ |
| 6. $36 - 12y + y^2$ | 7. $a^3 - b^3$ | 8. $k^3 + n^3$ | 9. $y^3 + 64$ | 10. $c^3 - 729$ |
| 11. $d^6 + h^3$ | 12. $p^3 - w^{12}$ | 13. $3c^4 - 81c$ | 14. $5j^5 + 5000j^2$ | 15. $x^3 - x$ |
| 16. $y - y^3$ | 17. $x^6 - y^6$ | | | |

Answers to odd problems:

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|--|-----------------------------------|-------------------------------|------------------------------|
| 1. $(x + 5)^2$ | 3. $(2a - 9b)^2$ | 5. $-(r - 10s)^2$ | 7. $(a - b)(a^2 + ab + b^2)$ |
| 9. $(y + 4)(y^2 - 4y + 16)$ | 11. $(d^2 + h)(d^4 - d^2h + h^2)$ | 13. $3c(c - 3)(c^2 + 3c + 9)$ | 15. $x(x + 1)(x - 1)$ |
| 17. $(x + y)(x^2 - xy + y^2)(x - y)(x^2 + xy + y^2)$ | | | |

Worksheet 3: Factor each polynomial completely.

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| 1. $2a^4 + 10a^3 - 72a^2$ | 2. $x^4 - 3x^2 - 40$ | 3. $x^4 + x^3 + x^2$ | 4. $y^3 - y^4 + y^5$ |
| 5. $16x^3 - 2$ | 6. $3y - 81y^4$ | 7. $7x - 7y + ax - ay$ | |
| 8. $5a^2 - 15ab - 6ac + 18bc$ | 9. $y^2 - cy + dy - cd$ | 10. $ax + 2bx - 3ay - 6by$ | |
| 11. $mn - 3my + 2nx - 6xy$ | 12. $3ab + 3ax - 2b - 2x$ | 13. $(x - 1)^2 - y^2$ | 14. $(x + 3)^2 - a^2$ |
| 15. $36 + 12(a + 5) + (a + 5)^2$ | 16. $49 - 14(2 - b) + (2 - b)^2$ | 17. $x^2 - y^2 + 4y - 4x$ | 18. $h^3 + 4h^2 - 9h - 36$ |