

NAME _____ DATE _____

#1-37
E00

Factoring Pattern for $x^2 + bx + c$, c Positive;
Factoring Pattern for $x^2 + bx + c$, c Negative

Factor. Check by multiplying the factors. If the polynomial is not factorable, write "prime."

1. $y^2 + 7y + 12$ _____

2. $a^2 - 5a + 6$ _____

3. $x^2 + 8x + 12$ _____

4. $x^2 - 15x + 35$ _____

5. $x^2 - 13x + 40$ _____

6. $x^2 - 11x + 10$ _____

7. $y^2 - 14y + 48$ _____

8. $a^2 - 15a + 26$ _____

9. $30 - 17x + x^2$ _____

10. $x^2 - 11xy + 18y^2$ _____

11. $c^2 - 14cd + 45d^2$ _____

12. $a^2 + 12ab + 36b^2$ _____

13. $d^2 - 23d + 60$ _____

14. $x^2 - 9x + 14$ _____

15. $y^2 + 18yz + 77z^2$ _____

16. $x^2 + 17xy + 42y^2$ _____

17. $a^2 + 11ab + 18b^2$ _____

18. $y^2 - 35yz + 150z^2$ _____

19. $a^2 + 19ab + 60b^2$ _____

20. $x^2 - 19xy + 34y^2$ _____

21. $x^2 + 2x - 8$ _____

22. $y^2 - 5y - 14$ _____

23. $y^2 - 7y - 18$ _____

24. $a^2 + 3a - 21$ _____

25. $x^2 - 5x - 24$ _____

26. $a^2 - 6a - 16$ _____

27. $y^2 + 4y - 45$ _____

28. $x^2 - 19x - 20$ _____

29. $x^2 + 12x - 48$ _____

30. $v^2 + 2v - 24$ _____

31. $x^2 - x - 30$ _____

32. $x^2 - 6x - 27$ _____

33. $k^2 - 23kd - 50d^2$ _____

34. $a^2 + 7ab - 60b^2$ _____

35. $y^2 - 12yz - 45z^2$ _____

36. $e^2 + 4ef - 21f^2$ _____

37. $x^2 - 2xy - 8y^2$ _____

38. $a^2 + 2ab - 48b^2$ _____

39. $a^2 - ab - 90b^2$ _____

40. $x^2 + 4xy - 45y^2$ _____

NAME _____ DATE _____

Factoring Pattern for $ax^2 + bx + c$; Factoring by Grouping

#1-20
ALL

Factor. Check by multiplying the factors. If the polynomial is not factorable, write "prime."

1. $2x^2 + 7x + 5$ _____

2. $6x^2 + 17x + 12$ _____

3. $2x^2 + x - 6$ _____

4. $10x^2 + 7x - 2$ _____

5. $3x^2 + 4x + 1$ _____

6. $3x^2 - 2x - 1$ _____

7. $2x^2 - 5x + 2$ _____

8. $6x^2 - 5x - 6$ _____

9. $15x^2 + x - 6$ _____

10. $15x^2 + 14x - 8$ _____

11. $10 - 3y - y^2$ _____

12. $6x^2 - 13x + 6$ _____

13. $3a^2 + 36a + 10$ _____

14. $3a^2 + 5ab - 12b^2$ _____

15. $3x^2 - 16x + 5$ _____

16. $42x^2 - 47x - 9$ _____

17. $x^2 - 2xy - 63y^2$ _____

18. $3x^2 + 5xy - 12y^2$ _____

19. $36d^2 + 5d - 24$ _____

20. $21x^2 + 58xy + 21y^2$ _____

Factor. Check by multiplying the factors.

21. $a(x - 3) + c(x - 3)$ _____

22. $m(2r - 3) + n(2r - 3)$ _____

23. $3x(y - 4) - 2(y - 4)$ _____

24. $(e - 9) + f(e - 9)$ _____

25. $bx + 2x - by - 2y$ _____

26. $ay - 4a - by + 4b$ _____

27. $x^3 - 5x^2 + 3x - 15$ _____

28. $x(c - 3) - y(3 - c)$ _____

29. $5x(y - 5) - (5 - y)$ _____

30. $2y(5x - 2) - 3(2 - 5x)$ _____

Factor each expression as a difference of two squares.

31. $a^2 - (x + 1)^2$ _____

32. $(c - d)^2 - e^2$ _____

33. $16 - (2x + y)^2$ _____

34. $(x - 3y)^2 - 36$ _____

35. $x^2 + 10x + 25 - y^2$ _____

36. $a^2 - 2ab + b^2 - 4$ _____

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Factoring Pattern for $x^2 + bx + c$, c Positive;
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Factor. Check by multiplying the factors. If the polynomial is not factorable, write "prime."

1. $y^2 + 7y + 12$ $(y+4)(y+3)$
2. $a^2 - 5a + 6$ $(a-3)(a-2)$
3. $x^2 + 8x + 12$ $(x+6)(x+2)$
4. $x^2 - 15x + 35$ Prime
5. $x^2 - 13x + 40$ $(x-8)(x-5)$
6. $x^2 - 11x + 10$ $(x-10)(x-1)$
7. $y^2 - 14y + 48$ $(y-8)(y-6)$
8. $a^2 - 15a + 26$ $(a-13)(a-2)$
9. $30 - 17x + x^2$ $(15-x)(2-x)$
10. $x^2 - 11xy + 18y^2$ $(x-9y)(x-2y)$
11. $c^2 - 14cd + 45d^2$ $(c-9d)(c-5d)$
12. $a^2 + 12ab + 36b^2$ $(a+6b)^2$
13. $d^2 - 23d + 60$ $(d-20)(d-3)$
14. $x^2 - 9x + 14$ $(x-7)(x-2)$
15. $y^2 + 18yz + 77z^2$ $(y+11z)(y+7z)$
16. $x^2 + 17xy + 42y^2$ $(x+14y)(x+3y)$
17. $a^2 + 11ab + 18b^2$ $(a+9b)(a+2b)$
18. $y^2 - 35yz + 150z^2$ $(y-30z)(y-5z)$
19. $a^2 + 19ab + 60b^2$ $(a+15b)(a+4b)$
20. $x^2 - 19xy + 34y^2$ $(x-17y)(x-2y)$
21. $x^2 + 2x - 8$ $(x+4)(x-2)$
22. $y^2 - 5y - 14$ $(y-7)(y+2)$
23. $y^2 - 7y - 18$ $(y-9)(y+2)$
24. $a^2 + 3a - 21$ Prime
25. $x^2 - 5x - 24$ $(x-8)(x+3)$
26. $a^2 - 6a - 16$ $(a-8)(a+2)$
27. $y^2 + 4y - 45$ $(y+9)(y-5)$
28. $x^2 - 19x - 20$ $(x-20)(x+1)$
29. $x^2 + 12x - 48$ Prime
30. $v^2 + 2v - 24$ $(v+6)(v-4)$
31. $x^2 - x - 30$ $(x-6)(x+5)$
32. $x^2 - 6x - 27$ $(x-9)(x+3)$
33. $k^2 - 23kd - 50d^2$ $(k-25d)(k+2d)$
34. $a^2 + 7ab - 60b^2$ $(a+12b)(a-5b)$
35. $y^2 - 12yz - 45z^2$ $(y-15z)(y+3z)$
36. $e^2 + 4ef - 21f^2$ $(e+7f)(e-3f)$
37. $x^2 - 2xy - 8y^2$ $(x-4y)(x+2y)$
38. $a^2 + 2ab - 48b^2$ $(a+8b)(a-6b)$
39. $a^2 - ab - 90b^2$ $(a-10b)(a+9b)$
40. $x^2 + 4xy - 45y^2$ $(x+9y)(x-5y)$

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Factoring Pattern for $ax^2 + bx + c$; Factoring by Grouping

Factor. Check by multiplying the factors. If the polynomial is not factorable, write "prime."

- | | |
|--|---|
| 1. $2x^2 + 7x + 5$ <u>$(2x+5)(x+1)$</u> | 2. $6x^2 + 17x + 12$ <u>$(3x+4)(2x+3)$</u> |
| 3. $2x^2 + x - 6$ <u>$(2x-3)(x+2)$</u> | 4. $10x^2 + 7x - 2$ <u>Prime</u> |
| 5. $3x^2 + 4x + 1$ <u>$(3x+1)(x+1)$</u> | 6. $3x^2 - 2x - 1$ <u>$(3x+1)(x-1)$</u> |
| 7. $2x^2 - 5x + 2$ <u>$(2x-1)(x-2)$</u> | 8. $6x^2 - 5x - 6$ <u>$(3x+2)(2x-3)$</u> |
| 9. $15x^2 + x - 6$ <u>$(5x-3)(3x+2)$</u> | 10. $15x^2 + 14x - 8$ <u>$(5x-2)(3x+4)$</u> |
| 11. $10 - 3y - y^2$ <u>$(5+y)(2-y)$</u> | 12. $6x^2 - 13x + 6$ <u>$(3x-2)(2x-3)$</u> |
| 13. $3a^2 + 36a + 10$ <u>Prime</u> | 14. $3a^2 + 5ab - 12b^2$ <u>$(3a-4b)(a+3b)$</u> |
| 15. $3x^2 - 16x + 5$ <u>$(3x-1)(x-5)$</u> | 16. $42x^2 - 47x - 9$ <u>$(6x+1)(7x-9)$</u> |
| 17. $x^2 - 2xy - 63y^2$ <u>$(x-9y)(x+7y)$</u> | 18. $3x^2 + 5xy - 12y^2$ <u>$(3x-4y)(x+3y)$</u> |
| 19. $36d^2 + 5d - 24$ <u>$(9d+8)(4d-3)$</u> | 20. $21x^2 + 58xy + 21y^2$ <u>$(7x+3y)(3x+7y)$</u> |

19. $3h^2 + 2h - 16$
 $(3h+8)(h-2)$

21. $5p^2 - 22p + 8$
 $(5p-2)(p-4)$

23. $6z^2 - 5z - 4$
 $(3z-4)(2z+1)$

25. $18x^2 + 9xz + z^2$
 $(6x+z)(3x+z)$

27. $5l^2 - 26lx + 5x^2$
 $(5l-x)(l-5x)$

20. $6c^2 + 7c + 2$
 $(3c+2)(2c+1)$

22. $8m^2 - 10m + 3$
 $(2m-1)(4m-3)$

24. $15y^2 - y - 2$
 $(5y-2)(3y+1)$

26. $20m^2 + 13mn + 2n^2$
 $(4m+n)(5m+2n)$

28. $15s^2 - 16st + 4t^2$
 $(5s-2t)(3s-2t)$