

Factoring Practices
Algebra 2

Part I

$$a^2 - 36 = (a + 6)(a - 6)$$
$$3x^2 - 48 = 3(x^2 - 16) = 3(x + 4)(x - 4)$$

Factor, write prime if prime.

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|-------------------|--------------------|
| 1. $x^2 - 1$ | 12. $-x^2 + 16$ |
| 2. $x^2 - 9$ | 13. $36m^2 - 121$ |
| 3. $x^2 + 4$ | 14. $2x^2 - 8$ |
| 4. $x^2 - 25$ | 15. $25 + 4x^2$ |
| 5. $9y^2 - 16$ | 16. $4a^2 - 81b^2$ |
| 6. $4x^2 - 25$ | 17. $12x^2 - 75$ |
| 7. $9x^2 - 1$ | 18. $a^2b - b^3$ |
| 8. $a^2 - x^2$ | 19. $-98 + 2x^2$ |
| 9. $25 - m^2$ | 20. $5x^2 - 45y^2$ |
| 10. $x^2 - 16y^2$ | 21. $9x^4 - 4$ |
| 11. $25m^2 - n^2$ | 22. $16x^4 - y^2$ |

Part II

$$x^2 + 7x + 10 = (x)^2 + (2 + 5)x + (2)(5) = (x + 2)(x + 5)$$

Factor, write prime if prime.

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|---------------------|----------------------|
| 1. $x^2 + 6x + 8$ | 12. $x^2 - x - 6$ |
| 2. $c^2 + 5c + 6$ | 13. $y^2 + 3y - 18$ |
| 3. $y^2 - 9y + 14$ | 14. $b^2 + 7b - 18$ |
| 4. $x^2 - 10x + 16$ | 15. $a^2 + a - 56$ |
| 5. $a^2 + 12a + 27$ | 16. $c^2 - 4c - 12$ |
| 6. $x^2 - 14x + 24$ | 17. $x^2 - 9x - 36$ |
| 7. $x^2 - 15x + 36$ | 18. $y^2 + 4y - 21$ |
| 8. $y^2 + 21y + 54$ | 19. $x^2 - 22x - 75$ |
| 9. $m^2 + 13m - 36$ | 20. $x^2 - 3x - 40$ |
| 10. $x^2 - 8x + 15$ | 21. $45 + 14y + y^2$ |
| 11. $y^2 - 4y - 32$ | 22. $x^2 - 13x + 36$ |

Part III

$$2x^2 - 5x - 3 = (2x + 1)(x - 3)$$

Factor, write prime if prime.

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|----------------------|------------------------|
| 1. $2x^2 - 5x - 3$ | 11. $2n^2 - 3n - 14$ |
| 2. $3x^2 + 10x - 8$ | 12. $5n^2 + 2n + 7$ |
| 3. $2y^2 + 15y + 7$ | 13. $10x^2 + 13x - 30$ |
| 4. $7a^2 - 11a + 4$ | 14. $12y^2 + 7y + 1$ |
| 5. $5n^2 + 17n + 6$ | 15. $2n^2 + 9n - 5$ |
| 6. $4y^2 + 8y + 3$ | 16. $2x^2 + 7x + 6$ |
| 7. $3x^2 + 4x - 7$ | 17. $5a^2 - 42a - 27$ |
| 8. $2x^2 + 13x + 15$ | 18. $15x^2 - 28x - 32$ |
| 9. $9y^2 + 6y - 8$ | 19. $8a^2 - 10a + 3$ |
| 10. $6x^2 - 7x - 20$ | 20. $2y^2 - 3y - 20$ |

Part IV

$$5x^2 + 20x - 60 = 5(x^2 + 4x - 12) = 5(x + 6)(x - 2)$$

Factor Completely, write prime if prime.

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|----------------------|--------------------------|
| 1. $2x^2 - 8$ | 9. $4x^2 + 16x + 16$ |
| 2. $2x^2 + 8x + 6$ | 10. $18x + 12x^2 + 2x^3$ |
| 3. $3n^2 + 9n - 30$ | 11. $2x - 2xy^2$ |
| 4. $6x^2 - 26x - 20$ | 12. $3t^3 - 27t$ |
| 5. $2x^2 + 12x - 80$ | 13. $24a^2 - 30a + 9$ |
| 6. $5t^2 + 15t + 10$ | 14. $10x^2 + 15x - 10$ |
| 7. $8n^2 - 18$ | 15. $3x^2 - 42x + 147$ |
| 8. $14x^2 + 7x - 21$ | 16. $4x^4 - 4x^2$ |

Answers

Part I	Part II	Part III	Part IV
1. $(x + 1)(x - 1)$	1. $(x + 4)(x + 2)$	1. $(2x + 1)(x - 3)$	1. $2(x + 2)(x - 2)$
2. $(x + 3)(x - 3)$	2. $(c + 2)(c + 3)$	2. $(3x - 2)(x + 4)$	2. $2(x + 3)(x + 1)$
3. prime	3. $(y - 7)(y - 2)$	3. $(2y + 1)(y + 7)$	3. $3(n + 5)(n - 2)$
4. $(x + 5)(x - 5)$	4. $(x - 8)(x - 2)$	4. $(7a - 4)(a - 1)$	4. $2(3x + 2)(x - 5)$
5. $(3y + 4)(3y - 4)$	5. $(a + 9)(a + 3)$	5. $(5n + 2)(n + 3)$	5. $2(x + 10)(x - 4)$
6. $(2x + 5)(2x - 5)$	6. $(x - 12)(x - 2)$	6. $(2y + 3)(2y + 1)$	6. $5(t + 1)(t + 2)$
7. $(3x + 1)(3x - 1)$	7. $(x - 12)(x - 3)$	7. $(3x + 7)(x - 1)$	7. $2(2n + 3)(2n - 3)$
8. $(a + x)(a - x)$	8. $(y + 18)(y + 3)$	8. $(2x + 3)(x + 5)$	8. $7(2x + 3)(x - 1)$
9. $(5 + m)(5 - m)$	9. prime	9. $(3y - 2)(3y + 4)$	9. $4(x + 2)^2$
10. $(x + 4y)(x - 4y)$	10. $(x - 5)(x - 3)$	10. $(3x + 4)(2x - 5)$	10. $2x(3 + x)^2$ or $2x(x + 3)^2$
11. $(5m + n)(5m - n)$	11. $(y - 8)(y + 4)$	11. $(2n - 7)(n + 2)$	11. $2x(1 + y)(1 - y)$
12. $(4 + x)(4 - x)$	12. $(x - 3)(x + 2)$	12. prime	12. $3t(t + 3)(t - 3)$
13. $(6m + 11)(6m - 11)$	13. $(y + 6)(y - 3)$	13. $(2x + 5)(5x - 6)$	13. $3(2a - 1)(4a - 3)$
14. $2(x + 2)(x - 2)$	14. $(b + 9)(b - 2)$	14. $(3y + 1)(4y + 1)$	14. $5(2x - 1)(x + 2)$
15. prime	15. $(a + 8)(a - 7)$	15. $(2n - 1)(n + 5)$	15. $3(x - 7)^2$
16. $(2a + 9b)(2a - 9b)$	16. $(c - 6)(c + 2)$	16. $(2x + 3)(x + 2)$	16. $4x^2(x + 1)(x - 1)$
17. $3(2x + 5)(2x - 5)$	17. $(x - 12)(x + 3)$	17. $(5a + 3)(a - 9)$	
18. $b(a + b)(a - b)$	18. $(y + 7)(y - 3)$	18. $(3x - 8)(5x + 4)$	
19. $-2(7 + x)(7 - x)$ or $2(x + 7)(x - 7)$	19. $(x - 25)(x + 3)$	19. $(2a - 1)(4a - 3)$	
20. $5(x + 3y)(x - 3y)$	20. $(x - 8)(x + 5)$	20. $(2y + 5)(y - 4)$	
21. $(3x^2 + 2)(3x^2 - 2)$	21. $(y + 9)(y + 5)$		
22. $(4x^2 + y)(4x^2 - y)$	22. $(x - 9)(x - 4)$		