

[5.7] Factoring Pattern for $x^2 + bx + c$,
 c is positive

① $x^2 + 4x + 3$ ← 1·3
 $(x+1)(x+3)$
 $\underbrace{\hspace{1.5cm}}_{1x}$
 $\underbrace{\hspace{1.5cm}}_{3x}$

② $x^2 - 9x + 14$ ← 1·14, 7·2
 $(x-7)(x-2)$
 $\underbrace{\hspace{1.5cm}}_{-7x}$
 $\underbrace{\hspace{1.5cm}}_{-2x}$

③ $p^2 - 13p + 12$
 $(p-1)(p-12)$
 $\underbrace{\hspace{1.5cm}}_{-1p}$
 $\underbrace{\hspace{1.5cm}}_{-12p}$

④ $x^2 - 12x + 30$ ← 1·30, 2·15, 5·6, 3·10
 $(x \quad)(x \quad)$
 prime

⑤ $x^2 - 19x + 60$
 $(x-15)(x-4)$
 $\underbrace{\hspace{1.5cm}}_{-15x}$
 $\underbrace{\hspace{1.5cm}}_{-4x}$

⑥ $x^2 - 11xy + 28y^2$ ← 2·14, 4·7
 $(x-4y)(x-7y)$
 $\underbrace{\hspace{1.5cm}}_{-4xy}$
 $\underbrace{\hspace{1.5cm}}_{-7xy}$

⑦ $y^2 - 16yz + 48z^2$ ← 12·4
 $(y-12z)(y-4z)$
 $\underbrace{\hspace{1.5cm}}_{-12yz}$
 $\underbrace{\hspace{1.5cm}}_{-4yz}$

⑧ $75 + 20r + r^2$ ← 25·3, 15·5
 $(15+r)(5+r)$
 $\underbrace{\hspace{1.5cm}}_{5r}$
 $\underbrace{\hspace{1.5cm}}_{15r}$

⑨ $a^2 - 18ab + 45b^2$
 $(a-3b)(a-15b)$
 $\underbrace{\hspace{1.5cm}}_{-3ab}$
 $\underbrace{\hspace{1.5cm}}_{-15ab}$

Homework
 Set G
 WS 7-E
 (#2-36) x 2
 (only 1 prime)

7E Factoring Pattern for $x^2 + bx + c$, c positive

Objective: To factor quadratic trinomials whose quadratic coefficient is 1 and whose constant term is positive.

Vocabulary/Patterns

Factoring patterns for $x^2 + bx + c$ when c is positive:

When b is positive: $(x + ?)(x + ?)$

When b is negative: $(x - ?)(x - ?)$

Prime polynomial A polynomial with integral coefficients whose greatest monomial factor is 1 and which can't be written as a product of polynomials of lower degree. For example, $a^2 - 10a - 14$ is prime.

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

- | | |
|----------------------|----------------------|
| 1. $x^2 + 4x + 3$ | 2. $x^2 + 8x + 7$ |
| 3. $c^2 - 9c + 14$ | 4. $y^2 - 8y + 12$ |
| 5. $r^2 - 5r + 6$ | 6. $p^2 - 13p + 12$ |
| 7. $q^2 + 15q + 14$ | 8. $n^2 + 9n + 14$ |
| 9. $a^2 - 13a + 22$ | 10. $s^2 - 12s + 30$ |
| 11. $x^2 + 18x + 32$ | 12. $x^2 - 15x + 26$ |

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

- | | |
|----------------------|----------------------|
| 13. $a^2 + 10a + 30$ | 14. $x^2 - 19x + 60$ |
| 15. $k^2 - 21k + 54$ | 16. $n^2 + 23n + 90$ |
| 17. $k^2 - 10k + 21$ | 18. $x^2 - 14x + 45$ |
| 19. $k^2 + 7k + 12$ | 20. $x^2 - 16x + 48$ |
| 21. $a^2 - 11a + 20$ | 22. $x^2 + 22x + 72$ |
| 23. $7z - 17z + z^2$ | 24. $20 - 12c + c^2$ |
| 25. $54 - 15a + a^2$ | 26. $63 - 16c + c^2$ |

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

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|--------------------------|--------------------------|
| 27. $x^2 - 11xy + 28y^2$ | 28. $a^2 - 9ab + 18b^2$ |
| 29. $c^2 - 18cd + 45d^2$ | 30. $x^2 - 10xy + 21y^2$ |
| 31. $c^2 - 14cd + 24d^2$ | 32. $x^2 + 11xy + 30y^2$ |
| 33. $y^2 - 16yz + 48z^2$ | 34. $a^2 - 18ab + 45b^2$ |
| 35. $d^2 + 10de + 24e^2$ | 36. $y^2 - 27yz + 72z^2$ |