8-1 Factors and Greatest Common Factors

☐ **FACTORS:** a number or numbers that are multiplied together to get a product.

$$3 * 4 = 12$$

factors   product

☐ **GREATEST COMMON FACTOR (GCF):** the biggest factor found in all factors for each number, monomial, or expression.

15: 1, ③, 5, 15

18: 1, 2, ③, 6, 9, 18

The GCF of 15 and 18 is ③.

Examples:

Find the GCF of each pair of numbers

1) 12 and 24

12: 1, 2, 3, 4, 6, ⑫   ⑫

24: 1, 2, 3, 4, 6, 8, ⑫, 24

2) 15 and 40

15: 1, 3, ⑤, 15   ⑤

40: 1, 2, 4, ⑤, 8, 10, 20, 40

3) 36 and 48

36: 1, 2, 3, 4, 6, 9, ⑫, 18, 36   ⑫

48: 1, 2, 3, 4, 6, 8, ⑫, 16, 24, 48

□FINDING THE GCF OF MONOMIALS

4) $12y$ and $15y^2$

$12y$: 1, 2, ③, 4, 6, 12, ④
$15y^2$: 1, ③, 5, 15, ④, y $\boxed{3y}$

5) $3p^4$ and $2p^2$

$3p^4$: ①, 3, p, p, p, p
$2p^2$: ①, 2, p, p $1p^2 \rightarrow \boxed{p^2}$

6) $14xy^2$ and $21xy^3$

$14xy^2$: 1, 2, ⑦, 14, x, y, y
$21xy^3$: 1, 3, ⑦, 21, x, y, y, y $\boxed{7xy^2}$

□FINDING THE GCF OF EXPRESSIONS

7) $5(x-3)$ and $25(x-3)^3$ $\boxed{5(x-3)}$

$5(x-3)$: 1, ⑤, (x-3)
$25(x-3)^3$: 1, ⑤, 25, (x-3), (x-3)(x-3)

8) $12(a-4)^5$ and $2(a-4)^4$ $\boxed{2(a-4)^4}$

$12(a-4)^5$: 1, ②, 3, 4, 6, 12, (a-4)(a-4)(a-4)(a-4)(a-4)
$2(a-4)^4$: 1, ②, (a-4)(a-4)(a-4)(a-4)

9) $-7(z-9)^8$ and $14(z-9)^2$

$-7(z-9)^8$: -1, 1, -7, ⑦, $(z-9)^8$
$14(z-9)^2$: 1, 2, ⑦, 14, $(z-9)^2$

$\boxed{7(z-9)^2}$