Factoring

SPECIAL PRODUCTS

Perfect Squares	$(a + b)^2 = a^2 + 2ab + b^2$; $(a - b)^2 = a^2 - 2ab + b^2$
Difference of Squares	$a^2 - b^2 = (a + b)(a - b)$
Sum of Cubes	$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
Difference of Cubes	$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

EQUIVALENCES

Factoring Out −1	$b - a = -(a - b)$
Commutative Law of Addition	$a + b = b + a$
Reversing Differences	$(b - a)^n = (a - b)^n$ when n is even, and $(b - a)^n = -(a - b)^n$ when n is odd

COMMON ERRORS

$(a + b)^2 \neq a^2 + b^2$ $(a - b)^2 \neq a^2 - b^2$ $(a + b)^3 \neq a^3 + b^3$ $(a - b)^3 \neq a^3 - b^3$

$a^2 + b^2$ is not factorable. See "Special Products" above for the details of how to deal with these expressions.

EXERCISES

A. Factor out the greatest common factor:

1) $8t + 8$

2) $5w - 35$

3) $-4h - 4k$

4) $rr^2 - 5r$

5) $-x^2 - x$

6) $-7y^4 + 21y^2 - 7$

7) $r^2s - rs^2$

8) $2y(3y - 2) - (3y - 2)$

9) $3x^2(2x - 1) - 6(1 - 2x)$

10) $5(4 - y) - b(y - 4)$

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