8.3 FINDING SPECIAL PRODUCTS OF POLYNOMIALS

Difference of Squares

subtraction

$(a + b)(a - b)$

same

same

$a^2 - b^2$

squares

squares

diff.

Find $(4x + 7)(4x - 7)$.

Use the difference of squares rule.

$$(a + b)(a - b) = a^2 - b^2$$

$$(4x + 7)(4x - 7) = (4x)^2 - (7)^2$$

$$= 16x^2 - 49$$

1. $(b - 2c)(b + 2c)$

$a^2 - b^2$

$(b)^2 - (2c)^2$

$b^2 - 4c^2$

2. $(6k + 11)(6k - 11)$

$a^2 - b^2$

$(6k)^2 - (11)^2$

$36k^2 - 121$

3. $(6w + \frac{1}{2}z)(6w - \frac{1}{2}z)$

$a^2 - b^2$

$(6w)^2 - (\frac{1}{2}z)^2$

$\boxed{36w^2 - \frac{1}{4}z^2}$

4. $(2b - 5)(2b + 5)$

$a^2 - b^2$

$(2b)^2 - (5)^2$

$\boxed{4b^2 - 25}$

CHALLENGE...

5. $(3m + 2)(3m - 2)(m + 7)$

$a^2 - b^2$

$(3m)^2 - (2)^2 \cdot (m+7)$

$(9m^2 - 4)(m + 7)$ FOIL or dist. prop.

FOIL

$(9m^2)(m) + (9m^2)(7) + (-4)(m) + (-4)(7)$

$9m^3 + 63m^2 - 4m - 28$

dist prop

$9m^2(m+7) - 4(m+7)$

$9m^2 \cdot m + 9m^2 \cdot 7 - 4 \cdot m + -4 \cdot 7$

$9m^3 + 63m^2 - 4m - 28$

$9m^3 + 63m^2 - 4m - 28$

6. $(k + 2)(k - 5)(k - 2)(k + 5)$

$(k+2)(k-2)$ $(k-5)(k+5)$

$(k)^2 - (2)^2$ $(k)^2 - (5)^2$

$(k^2 - 4) \cdot (k^2 - 25)$

FOIL

$(k^2)(k^2) + (k^2)(-25) + (-4)(k^2) + (-4)(-25)$

$k^4 + \boxed{-25k^2 + -4k^2} + 100$

$k^4 - 29k^2 + 100$

dist. prop.

$k^2(k^2 - 25) - 4(k^2 - 25)$

$k^2 \cdot k^2 - k^2 \cdot 25 - 4 \cdot k^2 - 4 \cdot 25$

$k^4 \boxed{-25k^2 - 4k^2} + 100$

$k^4 - 29k^2 + 100$