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SECTION 5.5: Multiplication of Polynomials (p. 380 – 387)

- ☐ Multiply monomials (p. 381)
- ☐ Distributive law: $a \cdot (b \pm c) = a \cdot b \pm a \cdot c$
- ☐ The product of a monomial and a polynomial (p. 382)
- ☐ The product of two polynomials (p. 383)

Multiply each of the following. Show all steps.

1. $(2x-1)(x-8)$ $= 2x(x-8) - 1\cdot(x-8)$

$= 2x^2 - 16x - x + 8$

$= \boxed{2x^2 - 17x + 8}$

2. $(t-3)^2$ $= (t-3)\cdot(t-3)$

$= t\cdot(t-3) - 3\cdot(t-3)$

$= t^2 - 3t - 3t + 9$

$= \boxed{t^2 - 6t + 9}$

Note on Notation

• Any time we write

$b^2 = b\cdot b$

for any base b, we call this a perfect square

3. $(3y+2)(y-5)$ $= 3y\cdot(y-5) + 2\cdot(y-5)$

$= 3y^2 - 15y + 2y - 10$

$= \boxed{3y^2 - 13y - 10}$

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4. $(2p-7)^2$ $= (2p-7)\cdot(2p-7)$

$= 2p\cdot(2p-7) - 7\cdot(2p-7)$

$= 4p^2 - 14p - 14p + 49$

$= \boxed{4p^2 - 28p + 49}$

Note on Notation

- When we write the perfect square of a binomial $(A+B)^2$ as a trinomial given by $A^2+2AB+B^2$ we call this a perfect-square trinomial (it comes from a perfect squ

VII. FACTOR BY GROUPING (6.1 p. 439)

Factor completely using the factor by group technique:

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

$= x\cdot(x-1) + 3\cdot(x-1)$

$= \boxed{(x+3)\cdot(x-1)}$

6. $2m^2 - 6m + 5m - 15$ $= (2m^2 - 6m) + (5m - 15)$

$= 2m\cdot(m-3) + 5\cdot(m-3)$

$= \boxed{(2m+5)\cdot(m-3)}$

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SECTION 6.3: Trinomials of the type $ax^2 + bx + c$ (p. 455 – 464)

- □ The FOIL Method to factoring: $ax^2 + bx + c$ (p. 455 - 456)
- □ Tips for factoring $ax^2 + bx + c$ with FOIL (p. 458)
- □ The AC Method to factoring: $ax^2 + bx + c$ (p. 458 - 459)
- □ Algebraic and graphical approach to solving $ax^2 + bx + c = 0$ (p. 461)

Solve each of the following quadratic equations using the zero product property:

7. $n^2 + 3n - 54 = 0$

$a = 1,\ b = 3,\ c = -54$

Multiply

-54

$9 \quad -6$

$+3$

Add

$\Rightarrow 3n = 9n - 6n$

$\Rightarrow n^2 + 9n - 6n - 54 = 0$

$\Rightarrow n(n+9) - 6\cdot(n+9) = 0$

$\Rightarrow (n-6)\cdot(n+9) = 0$

$\Rightarrow n - 6 = 0$ or $n + 9 = 0$ $\Rightarrow$ $\boxed{n = 6}$ or $\boxed{n = -9}$

8. $3x^2 + x - 4 = 0$

$a = 3,\ b = 1,\ c = -4$

Multiply

-12

$+4 \quad -3$

$+1$

Add

$1x = 4x - 3x$

$\Rightarrow 3x^2 - 3x + 4x - 4 = 0$

$\Rightarrow 3x\cdot(x-1) + 4\cdot(x-1) = 0$

$\Rightarrow (3x+4)\cdot(x-1) = 0$

$\Rightarrow 3x + 4 = 0$ or $x - 1 = 0$

$\Rightarrow$ $\boxed{x = -4/3}$ or $\boxed{x = 1}$

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9. $w^2 = -18w$ $\Rightarrow$ $w^2 + 18w = 0$

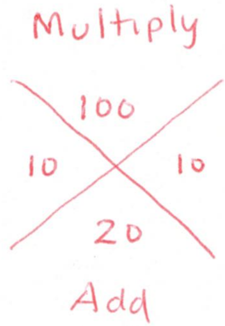
$\Rightarrow$ $w \cdot (w + 18) = 0$

$\Rightarrow$ $w = 0$ or $w + 18 = 0$

$\Rightarrow$ $\boxed{w = 0}$ or $\boxed{w = -18}$

10. $4w^2 + 20w + 25 = 0$

$a = 4, \ b = 20, \ c = 25$



$\Rightarrow$ $4w^2 + 10w + 10w + 25 = 0$

$\Rightarrow$ $2w(2w + 5) + 5 \cdot (2w + 5) = 0$ $\Rightarrow$ $20w = 10w + 10w$

$\Rightarrow$ $(2w + 5) \cdot (2w + 5) = 0$

$\Rightarrow$ $2w + 5 = 0$

$\Rightarrow$ $2w = -5$ $\Rightarrow$ $\boxed{w = -\frac{5}{2} = -2.5}$