

Multiplying Polynomials

To multiply monomials and polynomials, multiply coefficients, and add the exponents (keep the base)

$$x^a \cdot x^b = x^{a+b}$$

$$(x^a)^b = x^{a \cdot b}$$

Directions Multiply.

1. $(6y^3)(3y^5)$

$$18y^8$$

2. $(3mn^2)(9m^2n)$

$$27m^3n^3$$

3. $\left(\frac{1}{4}s^2t^2\right)(st)(-12st^2)$

$$-3s^4t^5$$

4. $(5x^5)(7x^4)$

$$35x^9$$

5. $(2r^2t)(5t^3)$

$$10r^2t^4$$

6. $\left(\frac{1}{3}x^2y\right)(12x^3z^2)(y^4z^5)$

$$4x^5y^5z^7$$

To multiply a polynomial by a monomial, distribute the monomial to each term in the polynomial (add the exponents)

Directions Multiply.

7. $4(3x^2 + 4x - 8)$

$12x^2 + 16x - 32$

8. $6pq(2p - q)$

$12p^2 - 6pq^2$

$6pq \cdot 2p - 6pq \cdot q$

9. $\frac{1}{2}x^2y(6xy + 8x^2y^2)$

$\frac{1}{2}x^2y \cdot 6xy + \frac{1}{2}x^2y \cdot 8x^2y^2$

$3x^3y^2 + 4x^4y^3$

10. $5r^2s^2(r - 3s)$

$5r^2s^2 \cdot r - 5r^2s^2 \cdot 3s$

$5r^3s^2 - 15r^2s^3$

11. $-3ab(5a^2 - b)$

$-15a^3b + 3ab^2$

12. $-4y^2(5y^4 - 3y^2 + 2)$

$-20y^6 + 12y^4 - 8y^2$

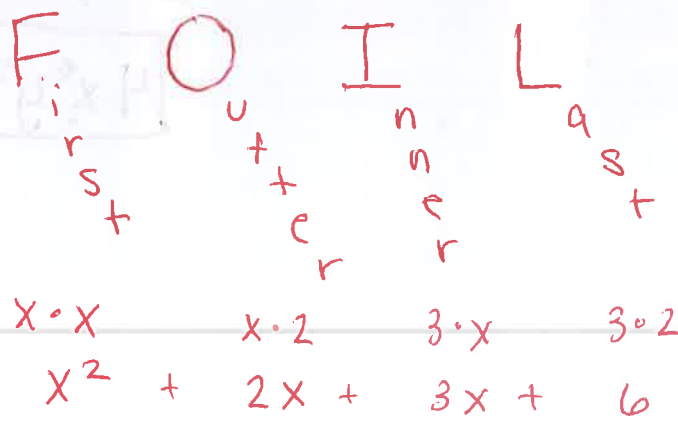
To multiply a binomial by a binomial, multiply each term in the 1st binomial by each term in the 2nd binomial

$(x + 3)(x + 2)$

$x^2 + 2x + 3x + 6$

$x^2 + 5x + 6$

A way to remember this:



Directions Multiply. Write your answer in standard form.

13. $(s-4)(s+2)$

F O I L

$$s^2 + 2s - 4s - 8$$

$$\boxed{s^2 - 2s - 8}$$

14. $(a+9)(a-9)$

F O I L

$$a^2 - 9a + 9a - 81$$

$$\boxed{a^2 - 81}$$

15. $(2a+3)(a+4)$

F O I L

$$2a^2 + 8a + 3a + 12$$

$$\boxed{2a^2 + 11a + 12}$$

16. $(4m-5)(m-3)$

F O I L

$$4m^2 - 12m - 5m + 15$$

$$\boxed{4m^2 - 17m + 15}$$

17. $(x-4)^2$ ← *Write it out twice!

$$(x-4)(x-4)$$

$$x^2 - 4x - 4x + 16$$

$$\boxed{x^2 - 8x + 16}$$

18. $(3x-4)^2$ ← *Write it out twice!

$$(3x-4)(3x-4)$$

$$9x^2 - 12x - 12x + 16$$

$$\boxed{9x^2 - 24x + 16}$$

19. $(2x+y)(3x-y)$

$$6x^2 - 2xy + 3xy - y^2$$

$$\boxed{6x^2 + xy - y^2}$$

20. $(2a-b^2)(a+4b^2)$

$$2a^2 + 8ab^2 - ab^2 - 4b^4$$

$$\boxed{2a^2 + 7ab^2 - 4b^4}$$

Mixed Review:

1.) $(4x^2 - 3x + 7) - (-2x^2 + 5x - 3)$

$$\underline{4x^2} - \underline{3x} + \underline{7} + \underline{2x^2} - \underline{5x} + \underline{3}$$

$$\boxed{6x^2 - 2x + 10}$$

2.) $-3xy^3(-4xy + 5x^2y^3)$

$$\boxed{12x^2y^4 - 15x^3y^6}$$

