

	Polynomial	Degree of Polynomial	Number of Terms	Coefficient of Second Term	Constant Term
a)	$-5x^{10} - 8x^9 + 2$	10	3	-8	+2
b)	$-4x^3y^7 + 10x^5y^2 - 5xy^3 + 3$ 10      7      4	10	4	+10	+3
c)	10a	1	1		

1. $2(x + 4 - 9y)$ $= 2(x) + 2(4) + 2(-9y)$ $= 2x - 18y + 8$	2. $3(x^2 + 4x + 11)$ $= 3(x^2) + 3(4x) + 3(11)$ $= 3x^2 + 12x + 33$	3. $-5(x^3 - 8y + 9x)$ $= (-5)(x^3) + (-5)(-8y) + (-5)(9x)$ $= -5x^3 + 40y - 45x$
4. $12(-x^2 - 4x + 3)$ $= (12)(-x^2) + (12)(-4x) + (12)(3)$ $= -12x^2 - 48x + 36$	5. $-9(x + y + 3z)$ $= (-9)(x) + (-9)(y) + (-9)(3z)$ $= -9x - 9y - 27z$	6. $-11(2x^2 - 4x^3 + x)$ $= (-11)(2x^2) + (-11)(-4x^3) + (-11)(x)$ $= -22x^2 + 44x^3 - 11x$ $= 44x^3 - 22x^2 - 11x$
1. $x(x + 2) = x^2 + 2x$	2. $x(x - 3) = x^2 - 3x$	3. $a(a + 1) = a^2 + a$
4. $t(t - 1) = t^2 - t$	5. $y(y + 4) = y^2 + 4y$	6. $m(m + 5) = m^2 + 5m$
7. $x(x - 5) = x^2 - 5x$	8. $y(y - 7) = y^2 - 7y$	9. $a(a - 10) = a^2 - 10a$
10. $3x(x + 2) = 3x^2 + 6x$	11. $4b(b - 11) = 4b^2 - 44b$	12. $5t(t + 3) = 5t^2 + 15t$
13. $2x(3 + x) = 6x + 2x^2$ $= 2x^2 + 6x$	14. $7y(y - 5) = 7y^2 - 35y$	15. $2x(x + 4) = 2x^2 + 8x$
16. $-x(x + 2) = -x^2 - 2x$	17. $-y(y - 3) = -y^2 + 3y$	18. $3(x^2 + 2x - 5) - x(x + 1)$ $= 3x^2 + 6x - 15 - x^2 - x$ $= 2x^2 + 5x - 15$
19. $5(x^2 + 2x - 7) + 3x(x + 1)$ $= 5x^2 + 10x - 35 + 3x^2 + 3x$ $= 5x^2 + 3x^2 + 10x + 3x - 35$ $= 8x^2 + 13x - 35$	20. $-(xz - 3x - 1) + x(3x + 2)$ $= -xz + 3x + 1 + 3x^2 + 2x$ $= 3x^2 + 5x - xz + 1$	21. $4(2x + 3) + 3x(x^2 - x + 3)$ $= 8x + 12 + 3x^3 - 3x^2 + 9x$ $= 3x^3 - 3x^2 + 17x + 12$
22. $3m(m - 2) + 4(m^2 - 5m + 6)$ $= 3m^2 - 6m + 4m^2 - 20m + 24$ $= 7m^2 - 26m + 24$	23. $5y(1 - y) + 3(2y^2 - 4y + 3)$ $= 5y - 5y^2 + 6y^2 - 12y + 9$ $= y^2 - 7y + 9$	24. $-3x(x + 2) + 2x(2x - 1)$ $= -3x^2 - 6x + 4x^2 - 2x$ $= x^2 - 8x$

**Expand and simplify.**

25. $x(x+3)-x(x-2)$ $=x^2+3x-x^2+2x$ $=5x$	26. $y(2+y)+y(y-1)$ $=2y+y^2+y^2-y$ $=2y^2+y$	27. $m(m-1)+m(m-1)$ $=m^2-m+m^2-m$ $=2m^2-2m$	28. $x(x+2)-(2x-2)$ $=x^2+2x+(-2x+2)$ $=x^2+2$
29. $y(y-4)-y(3-2y)$ $=y^2-4y-3y+2y^2$ $=3y^2-7y$	30. $a(2a-1)+a(a+1)$ $=2a^2-a+a^2+a$ $=3a^2$	31. $x(x-2)-x(x+1)$ $=x^2-2x-x^2-x$ $=-3x$	

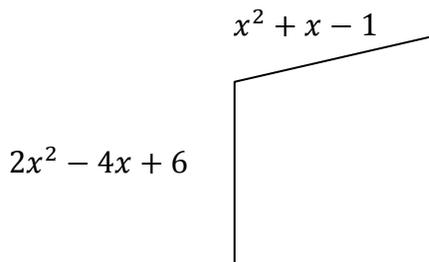
**Operations with Polynomials**

$(12y^2+17y-4)+(9y^2-13y+3)$ $=21y^2+4y-1$	$(2x^3+7x^2+x)+(2x^2-4x-12)$ $=2x^3+9x^2-3x-12$	$(-3m^2)+m+(4m^2+6m)$ $=m^2+7m$
$(7x^3+4z-1+2z^2-6z+2)$ $=7x^3+2z^2-2z+1$	$(3a^2+2a-2)-(a^2-3a+7)$ $=3a^2+2a-2+(-a^2+3a-7)$ $=2a^2+5a-9$	$(5x^2-2x-1)-(3x^2-5x+7)$ $=5x^2-2x-1+(-3x^2+5x-7)$ $=2x^2+3x-8$
$-(3z^2+4z)-(6z^2-2)$ $=+(-3z^2-4z)+(-6z^2+2)$ $=-9z^2-4z+2$	$(6x^3-4x^2+x-9)-(3x^2+7x+3)$ $=6x^3-4x^2+x-9+(-3x^2-7x-3)$ $=6x^3-7x^2-6x-12$	$(2x^2+1)+(x^2-2x+1)$ $=3x^2-2x+2$
$(-s^2-3)-(2s^2+10s)$ $=-s^2-3+(-2s^2-10s)$ $=-3s^2-10s-3$	$(5-9a)+4a^2+64-3$ $=4a^2-9a+66$	$(3x^2-x)+5x^3+(-4x^3+x^2-8)$ $=x^3+4x^2-x-8$
$-10(u+v)+8(u-1)-3(u+6)$ $=-10u-10v+8u-8-3u-18$ $=-5u-10v-18$	$7x-[2(x^2-z)+4x^2-7z]+6z^2$ $=7x-(2x^2-2z+4x^2-7z)+6z^2$ $=7x-(6x^2-9z)+6z^2$ $=7x-6x^2+9z+6z^2$ $=-6x^2+7x+9z+6z^2$	Subtract $t^4-3t^2+7$ from $5t^3-9$ $=5t^3-9-(t^4-3t^2+7)$ $=5t^3-9-t^4+3t^2-7$ $=-t^4+5t^3+3t^2-16$

<p>Subtract <math>y^5 - y^4</math> from <math>y^2 + 3y^4</math></p> $= y^2 + 3y^4 - (y^5 - y^4)$ $= y^2 + 3y^4 - y^5 + y^4$ $= -y^5 + 4y^4 + y^2$	<p>Add <math>4(m^2 + 2)</math> to <math>3m^2 + 7m</math></p> $= 3m^2 + 7m + 4(m^2 + 2)$ $= 3m^2 + 7m + 4m^2 + 8$ $= 7m^2 + 7m + 8$	<p><math>3(x^2 - 2x + 3) - 4(4x + 1) - (3x^2 - 2x)</math></p> $= 3x^2 - 6x + 9 - 16x - 4 - 3x^2 + 2x$ $= 3x^2 - 3x^2 - 6x - 16x + 2x + 9 - 4$ $= -20x + 5$
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**APPLICATION**

1. A park is in the shape of an irregular quadrilateral. Three sides of the park can be represented by the polynomials  $2x^2 - 4x + 6$ ,  $2x^2 + 5x - 2$  and  $x^2 + x - 1$ . If the total perimeter of the park can be represented by the polynomial  $8x^2 - 2x + 3$  find the expression for the missing side. Show a complete algebraic solution.



Missing side = Perimeter - (Sum of other sides)

$$= 8x^2 - 2x + 3 - (2x^2 - 4x + 6 + x^2 + x - 1 + 2x^2 + 5x - 2)$$

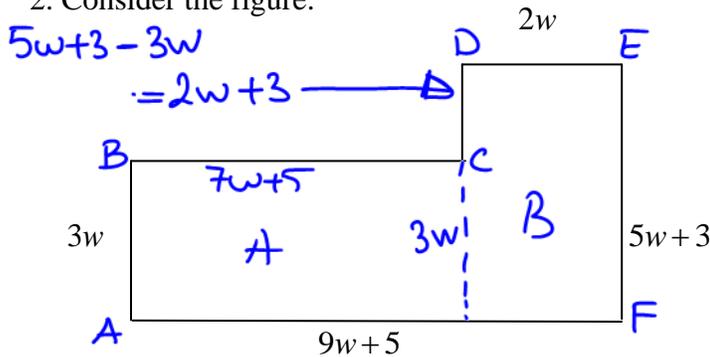
$$= 8x^2 - 2x + 3 - (5x^2 + 2x + 3)$$

$$= 8x^2 - 2x + 3 - 5x^2 - 2x - 3$$

$$= 3x^2 - 4x$$

$\therefore$  Missing side is  $3x^2 - 4x$

2. Consider the figure:



a. Fill in expressions for the missing sides.

side BC =  $9w + 5 - 2w = 7w + 5$       side DC =  $5w + 3 - 3w = 2w + 3$

b. Write and simplify an expression for the perimeter of the figure.

$$P = 3w + 7w + 5 + 2w + 3 + 2w + 5w + 3 + 9w + 5$$

$$= 28w + 16$$

c. Write, expand and simplify an expression for the area of the figure.



Area A =  $3w(7w + 5) = 21w^2 + 15w$       Area B =  $2w(5w + 3) = 10w^2 + 6w$

Total Area =  $21w^2 + 15w + 10w^2 + 6w$

$$= 31w^2 + 21w$$