

6-1 Adding and Subtracting Polynomials

Simplify each expression.

1)  $(8n^3 + 3n^2) + (3n^3 - 8n^2)$   
 $8n^3 + 3n^3 + 3n^2 - 8n^2$   
 $11n^3 - 5n^2$

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

7x	-2x <sup>4</sup>
3x	-7x <sup>4</sup>

 $10x - 9x^4$

3)  $(7p^2 + 6p^3) - (2p^3 + 7p^2)$   

7p <sup>2</sup>	+6p <sup>3</sup>
+7p <sup>2</sup>	-2p <sup>3</sup>

 $14p^2 + 4p^3$

4)  $(7x^3 - 5x^4) + (5x^3 - 7x^4)$   

7x <sup>3</sup>	-5x <sup>4</sup>
5x <sup>3</sup>	-7x <sup>4</sup>

 $12x^3 - 12x^4$

5)  $(4n^4 - 2n) + (n + 7)$   

4n <sup>4</sup>	-2n	+7
	+n	

 $4n^4 - n + 7$

6)  $(4k^2 + 3) - (4 + 3k^2)$   

4k <sup>2</sup>	3
-3k <sup>2</sup>	-4

 $k^2 - 1$

7)  $(5 + 5n^3) + (4 - 7n^3)$   

5	5n <sup>3</sup>
4	-7n <sup>3</sup>

 $9 - 2n^3$

8)  $(7 - 3n) + (3 - 3n^4)$   

7	-3n	-3n <sup>4</sup>
3		

 $10 - 3n - 3n^4$

9)  $(4n^4 + 5) - (5n^4 - 8)$   

4n <sup>4</sup>	5
-5n <sup>4</sup>	+8

 $-n^4 + 13$

10)  $(5 + 3a^2) + (4 + 5a^2)$   

5	3a <sup>2</sup>
4	5a <sup>2</sup>

 $9 + 8a^2$

11)  $(3m^4 - 6m^3 + 3) - (3m + 2 + 8m^4)$   

3m <sup>4</sup>	-6m <sup>3</sup>	3	-3m
-8m <sup>4</sup>		-2	

 $-5m^4 - 6m^3 + 1 - 3m$

12)  $(6x^2 - 1 + 5x) + (2 - 7x^2 - 7x^4)$   

6x <sup>2</sup>	-1	5x	-7x <sup>4</sup>
-7x <sup>2</sup>	2		

 $-x^4 - x^2 + 1 + 5x$

13)  $(7 - 4x^4 + x) - (2x^4 + 7x + 4)$   

7	-4x <sup>4</sup>	x
-4	-2x <sup>4</sup>	-7x

 $3 - 6x^4 - 6x$

14)  $(5 - n^3 - n^2) + (7n^2 - 4n^3 - 6)$   

5	-n <sup>3</sup>	-n <sup>2</sup>
-6	-4n <sup>3</sup>	7n <sup>2</sup>

 $-1 - 5n^3 + 6n^2$



$$15) (b^3 + 7b^4 + 2b^2) + (4b^3 + 2b^4 + b^2)$$

$b^3$	$7b^4$	$2b^2$
$4b^3$	$2b^4$	$b^2$

$$5b^3 + 9b^4 + 3b^2$$

$$16) (5 - 8k^4 + 8k^2) + (4k^4 - 5 + 4k^2)$$

$5$	$-8k^4$	$8k^2$
$-5$	$4k^4$	$4k^2$

$$-4k^4 + 12k^2$$

$$17) (5x^4 + 6 - x^2) + (3x^4 + 3x^2 + x^3)$$

$5x^4$	$6$	$-x^2$	$x^3$
$3x^4$		$3x^2$	

$$8x^4 + 6 + 2x^2 + x^3$$

$$18) (7 - 4n - 6n^4) - (6n^2 - 5 - 5n)$$

$7$	$-4n$	$-6n^4$	$-6n^2$
$+5$	$+5n$		

$$12 + n - 6n^4 - 6n^2$$

Name each polynomial by degree and number of terms.

19)  $-1$  Constant

20)  $-2m^2 - 2m$  Binomial  
Degree - 2

21)  $-2a + 5$  Binomial  
Degree - 1

22)  $-6k^3 + 6k^2 - 8k$  Trinomial  
Degree 3

23) A city wants to compare the number of people who own their own home and who rent their home. The polynomials below show expressions for each. In each polynomial,  $p = 0$  corresponds to the first year.

Own:  $4p^2 + 37p + 221$

Rent:  $6p^2 + 12p + 53$

Write an expression for how many more people own their home than rent their home.

$$\text{Own} - \text{Rent} = (4p^2 + 37p + 221) - (6p^2 + 12p + 53)$$

$4p^2$	$37p$	$221$
$-6p^2$	$-12p$	$-53$

$$-2p^2 + 25p + 168$$

24) Open-Ended: Write two different polynomials with a difference of  $-2x^2 + 7x - 8$

Subtraction

Possible Answer

$5x^2$	$3x$	$-10$
$-7x^2$	$-4x$	$-2$
$-2x^2$	$+7x$	$-8$

$$(5x^2 + 3x - 10) - (7x^2 - 4x - 2)$$