Name _____ Date _____ Class _____

LESSON 7-5

# Practice B

## *Polynomials*

**Find the degree and number of terms of each polynomial.**

**1.** $14h^3 + 2h + 10$ _____ _____

**2.** $7y - 10y^2$ _____ _____

**3.** $2a^2 - 5a + 34 - 6a^4$ _____ _____

**Write each polynomial in standard form. Then, give the leading coefficient.**

**4.** $3x^2 - 2 + 4x^8 - x$ _____ _____

**5.** $7 + 50j - 3j^3 - 4j^2$ _____ _____

**6.** $6k + 5k^4 - 4k^3 + 3k^2$ _____ _____

**Classify each polynomial by its degree and number of terms.**

**7.** $-5t^2 + 10$ _____ _____

**8.** $8w + 32 + 9w^4$ _____ _____

**9.** $b - b^3 - 2b^2 + 5b^4$ _____ _____

**Evaluate each polynomial for the given value.**

**10.** $3m + 8 - 2m^3$ for $m = -1$ _____

**11.** $4y^5 - 6y + 8y^2 - 1$ for $y = -1$ _____

**12.** $2w + w^3 - \frac{1}{2}w^2$ for $w = 2$ _____

**13.** An egg is thrown off the top of a building. Its height in meters above the ground can be approximated by the polynomial $300 + 2t - 4.9t^2$, where $t$ is the time since it was thrown in seconds.

**a.** How high is the egg above the ground after 5 seconds?

_____

**b.** How high is the egg above the ground after 6 seconds?

_____

LESSON 7-5

## Practice A

### *Polynomials*

**Find the degree and number of terms of each polynomial.**

**1.** $4w^2$ — Degree: 2; Terms: 1

**2.** $9x^3 + 2x$ — Degree: 3; Terms: 2

**3.** $4p^5 - p^3 + p^2 + 11$ — Degree: 5; Terms: 4

**Fill in each blank with *monomial*, *binomial*, or *trinomial*.**

**4.** A trinomial is a polynomial with three terms.

**5.** A monomial is a polynomial with one term.

**6.** A binomial is a polynomial with two terms.

**Write each polynomial in standard form. Then, give the leading coefficient.**

| | | |
|---|---|---|
| **7.** $12 + 3x^2 - x$ | $3x^2 - x + 12$ | 3 |
| **8.** $g^4 - 2g^3 - g^5$ | $-g^5 + g^4 - 2g^3$ | $-1$ |
| **9.** $k^2 + k^4 - k^3 + 1$ | $k^4 - k^3 + k^2 + 1$ | 1 |

**First, classify each polynomial by its degree (*linear*, *quadratic*, *cubic*, or *quartic*). Then, classify it by its number of terms (*monomial*, *binomial*, or *trinomial*).**

**10.** $109z^2$ — quadratic monomial

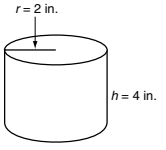
**11.** $3x + 11$ — linear binomial

**12.** $b^3 - 2 + 2b^4$ — quartic trinomial

**13.** Complete the table by evaluating the polynomial for each value of $z$.

| Polynomial | $z = 0$ | $z = 1$ | $z = 2$ | $z = -1$ | $z = -2$ |
|---|---|---|---|---|---|
| $2z + 3z^2 - 3$ | $-3$ | 2 | 13 | $-2$ | 5 |

**14.** The surface area of a cylinder is approximated by the polynomial $6r^2 + 6rh$, where $r$ is the radius and $h$ is the height of the cylinder. Find the approximate surface area of the cylinder at right.




72 in$^2$





LESSON 7-5

## Practice B

### *Polynomials*

**Find the degree and number of terms of each polynomial.**

**1.** $14h^3 + 2h + 10$ — 3; 3

**2.** $7y - 10y^2$ — 2; 2

**3.** $2a^2 - 5a + 34 - 6a^4$ — 4; 4

**Write each polynomial in standard form. Then, give the leading coefficient.**

| | | |
|---|---|---|
| **4.** $3x^2 - 2 + 4x^8 - x$ | $4x^8 + 3x^2 - x - 2$ | 4 |
| **5.** $7 + 50j - 3j^3 - 4j^2$ | $-3j^3 - 4j^2 + 50j + 7$ | $-3$ |
| **6.** $6k + 5k^4 - 4k^3 + 3k^2$ | $5k^4 - 4k^3 + 3k^2 + 6k$ | 5 |

**Classify each polynomial by its degree and number of terms.**

**7.** $-5t^2 + 10$ — quadratic binomial

**8.** $8w + 32 + 9w^4$ — quartic trinomial

**9.** $b - b^3 - 2b^2 + 5b^4$ — quartic polynomial

**Evaluate each polynomial for the given value.**

**10.** $3m + 8 - 2m^3$ for $m = -1$ — 7

**11.** $4y^5 - 6y + 8y^2 - 1$ for $y = -1$ — 9

**12.** $2w + w^3 - \frac{1}{2}w^2$ for $w = 2$ — 10

**13.** An egg is thrown off the top of a building. Its height in meters above the ground can be approximated by the polynomial $300 + 2t - 4.9t^2$, where $t$ is the time since it was thrown in seconds.

**a.** How high is the egg above the ground after 5 seconds?

187.5 m

**b.** How high is the egg above the ground after 6 seconds?

135.6 m





LESSON 7-5

## Practice C

### *Polynomials*

**Find the degree and number of terms of each polynomial.**

**1.** $5t^5 + 60 + 3t^3$ — 5; 3

**2.** $9p + 31p^9 + 6p^2 - 42$ — 9; 4

**3.** $-50 + 4r - r^3 + r^2 - 4r^5$ — 5; 5

**Simplify and write each polynomial in standard form. Then, give the leading coefficient.**

| | | |
|---|---|---|
| **4.** $4g^3 + 8g - 4g^3 + 2g^2$ | $2g^2 + 8g$ | 2 |
| **5.** $13 - 5h^3 + h^2 - h$ | $-5h^3 + h^2 - h + 13$ | $-5$ |
| **6.** $2(3x + 4) - 4x + 8x^2$ | $8x^2 + 2x + 8$ | 8 |

**Classify each polynomial according to its degree and number of terms.**

**7.** $6t^3 + 54t^4 - 1$ — quartic trinomial

**8.** $14 \cdot 3w^2 + w$ — quadratic binomial

**9.** $4(4s^2 - s) - 11 + s^7$ — 7th degree polynomial

**Evaluate each polynomial for the given value.**

**10.** $4m - 4 - 4m^3$ for $m = -2$ — 20

**11.** $12y^7 - 6y^2 + 8y^3 - y$ for $y = -1$ — $-25$

**12.** $-3a + a^3 - \frac{1}{3}a^2$ for $a = 3$ — 15

**13.** A certain company's profit in dollars can be modeled with the polynomial $-\frac{1}{2}x^2 + 100x - 200$ where $x$ is the number of items produced and sold.

**a.** What is the profit if they produce and sell 10 of their products? $750

**b.** What is the profit if they produce and sell 100 of their products? $4800

**c.** Evaluate the company's profit polynomial for $x = 0$. What does this number represent? $-200$

It represents how much money they will lose ($200) for not producing or selling anything.





LESSON 7-5

## Reteach

### *Polynomials*

A **monomial** is a number, a variable, or a product of numbers and variables with whole-number exponents. A **polynomial** is a monomial or a sum or difference of monomials.

The degree of the monomial is the sum of the exponents in the monomial.

**Find the degree of $8x^2y^3$.**

$8x^2y^3$ *The exponents are 2 and 3.*

The degree of the monomial is $2 + 3 = 5$.

**Find the degree of $-4a^6b$.**

$-4a^6b$ *The exponents are 6 and 1.*

The degree of the monomial is $6 + 1 = 7$.

The degree of the polynomial is the degree of the term with the greatest degree.

**Find the degree of $2x^4y^3 + 9x^5$.**

$\underbrace{2x^4y^3}_{7} + \underbrace{9x^5}_{5}$ Degree of the polynomial is 7.

**Find the degree of $4ab + 9a^3$.**

$\underbrace{4ab}_{2} + \underbrace{9a^3}_{3}$ Degree of the polynomial is 3.

The **standard form of a polynomial** is written with the terms in order from the greatest degree to the least degree. The coefficient of the first term is the **leading coefficient**.

**Write $5x + 6x^3 + 4 + 2x^4$ in standard form.**

$\underbrace{5x}_{1} + \underbrace{6x^3}_{3} + \underbrace{4}_{0} - \underbrace{2x^4}_{4}$ *Find the degree of each term.*

$2x^4 + 6x^3 + 5x + 4$ *Write the terms in order of degree.*

The leading coefficient is 2.

**Find the degree of each monomial.**

**1.** $7m^3n^5$ — 8

**2.** $6xyz$ — 3

**3.** $4x^2y^2$ — 4

**Find the degree of each polynomial.**

**4.** $x^5 + x^5y$ — 6

**5.** $4x^2y^3 + y^4 + 7$ — 5

**6.** $x^2 + xy + y$ — 2

**Write each polynomial in standard form. Then give the leading coefficient.**

| | | |
|---|---|---|
| **7.** $x^3 - 5x^4 - 6x^5$ | $-6x^5 - 5x^4 + x^3$ | $-6$ |
| **8.** $2x + 5x^2 - x^3$ | $-x^3 + 5x^2 + 2x$ | $-1$ |
| **9.** $8x + 7x^2 - 1$ | $7x^2 + 8x - 1$ | 7 |