

MAT 0020 Basic Algebra II

KEY CONCEPT REVIEW

CHAPTER 3: SECTIONS 3.1 – 3.4

TO RECEIVE CREDIT, DO ALL PROBLEMS, MAKE CORRECTIONS, AND SHOW YOUR WORK.

Match each expression with the operation and rule needed to simplify each. A letter may be used more than once or not at all.

Expression	Operation	Rule
1) $\left(\frac{a^2}{b^3c}\right)^5$	A) Subtract the exponents	a) Power of a quotient
2) $p^3 \cdot p^5 \cdot p^7$	B) Divide the exponents	b) Power rule
3) $y^3 + y^5$	C) Multiply the exponents	c) Quotient rule
4) $(-2x^2yz^{-4})^3$	D) Add the exponents	d) Power of a product
5) $\frac{3r^8s^6}{-27r^4s^2}$	E) None of these	e) Product rule
6) $(x^4)^5$		f) None of these
7) $(5x^2y)(-3x^4y^2)$		

8) **Evaluate each expression.**

- a) -2^4
- b) -2^{-4}
- c) $\left(-\frac{1}{2}\right)^{-4}$

9) **Evaluate each expression for $x = -2$.**

- a) $x^0 - 2$
- b) $-7x^3$
- c) $\frac{12}{3x^3}$

10) **Which expression evaluates to 1?**

- A) $(-5x^2y)^0$
- B) $-5x^2y^0$

11) **Write each expression with positive exponents.**

- a) $(-4a^{-2})$
- b) $\left(-\frac{4}{a}\right)^{-2}$

12) **Simplify each expression.**

- a) $-2^0 - 3^0$
- b) $-2^0 - 3^{-1}$

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Simplify.

13) $(-3x^2y)(-7x^6y^5)$

14) $\left(\frac{-5x^2y^5}{x^4y}\right)^3$

15) $\frac{12m^7n^9}{-6m^{15}n^4}$

Simplify. Write the result with positive exponents only.

16) $\frac{y^{-6}}{y^3}$

17) $\frac{7x^{-4} \cdot (x^{-8})^2}{8(x^3)^{-2}}$

18) $\left(\frac{m^{-2}n^5}{m^6n^{-1}}\right)^{-2}$

19) $\frac{(8x^3y^2z^0)^2(4x^{-3}yz^4)^0}{2x^2yz}$

20) $(-2x^3y^{-4})(4x^{-1}y)$

A) $\frac{2x^2}{y^3}$

B) $\frac{-8x^4}{y^5}$

C) $\frac{-8x^2}{y^3}$

D) $\frac{-x^2}{2y^5}$

21) $\frac{a^2b^{-8}c^0}{a^{-2}b^4}$

22) $(3x^2y^4)^3(3x^2y^4)^{-3}$

Key Concept Review, Chapter 3, Sections 3.1 – 3.

23) Write each number in scientific notation.

a) 0.00001328

b) 15,200,000

24) Write each number in standard notation.

a) 1.537×10^{-6}

b) 2.585×10^4

25) Evaluate the polynomial for $x = -4$:
 $2x^2 + 7x - 4$

A) 56

B) 0

C) -64

D) -8

Solve.

26) A projectile is fired upward from the ground with an initial velocity of 200 feet per second. The height of the projectile at any time t can be described by the polynomial $-16t^2 + 200t$. Find the height of the projectile when $t = 9$ seconds.

A) 504 feet

B) 1656 feet

C) 604 feet

D) 1800 feet

Complete the table for the given polynomial.

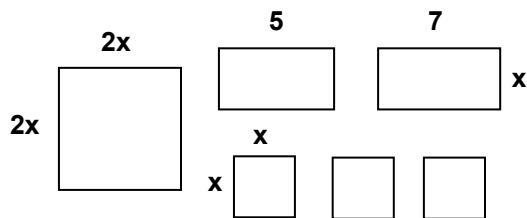
27) $-14x^4 - 12x^3 + 7x - 3$

Term	Coefficient	Degree of Term
$-14x^4$		
		3
	7	
-3		

28) What is the degree of the polynomial given in problem 28?

29) Use the drawing below to answer the following questions.

- a) Write a polynomial expression that describes the sum of the areas of the rectangles and squares.
- b) Simplify the polynomial and write the answer in descending powers.
- c) State whether the answer to part (a) is a monomial, binomial, or trinomial and find its degree.



30) Simplify each polynomial by combining like terms.

- a) $15r + 9r^4 + 2r^4 - 5r$
- b) $-17x^4 + 9x^3y^3 + 17 + 13y^3x^3 - 7x^4 - 6$

31) Add the polynomials.

- a) $(8x^2 - 5x + 2) + (5x^2 - 7x - 3)$
- b) $(7x^2 - xy - y^2) + (x^2 + 3xy + 5y^2)$

32) Subtract the polynomials.

- a) $(-9x^7 - 20x^6 - 9) - (-17x^6 + 4x^7 - 16)$
- b) $(5x^2y^3 - 10xy^4) - (15x^2y^3 + 9xy^4 - 1)$

Perform the indicated operations.

- 33) Subtract $(x^2 + 3x - 10)$ from the sum of $(-2x^2 + 5x + 7)$ and $(x^2 + 9x - 11)$