

Algebra II

Review 5.1 – 5.3, 4.1 – 4.4

Evaluate the expression if  $a = 2$ ,  $b = \frac{1}{5}$ , and  $c = 10$ .

1.  $ac^2$  200

2.  $(ac)^{-1}$   $\frac{1}{20}$

3.  $a^{-3}b^2$   $\frac{1}{200}$

4.  $b^2c^{-2}$   $\frac{1}{2500}$

5.  $b^2c^{-4}$   $\frac{1}{250000}$

6.  $(a^{-1}b)^{-2}$  100

Express in simplest form, without negative or zero exponents.

7.  $\frac{35x^2y^3}{-7x^3y}$   $-\frac{5y^2}{x}$

8.  $\left(\frac{3x}{y^3}\right)^2$   $\frac{9x^2}{y^6}$

9.  $(x^2y^{-5})(2x^{-4}y^4)$   $\frac{2}{x^2y}$

10.  $\frac{-12a^3b^{-3}c}{8ab^{-2}c^{-3}}$   $-\frac{3a^2c^4}{2b}$

11.  $\left(\frac{c^2}{d}\right)^{-3}(2c^{-1}d)^{-3}$   $\frac{1}{8c^3}$

12.  $\left(\frac{x^2}{5y}\right)\left(\frac{x}{y}\right)^{-2}$   $\frac{y}{5}$

13.  $\frac{y^2}{x^6} - \left(\frac{1}{x^{-3}y}\right)^{-2}$  0

14.  $x^4((x^{-2})^2 - 2x^{-2})$   $1 - 2x^2$

Simplify each quantity as much as possible. Express your final answer in scientific notation. Then complete each statement with  $<$ ,  $=$ , or  $>$ . No calculators!

15.  $2.78 \times 10^4$   $>$   $2.78 \times 10^{-6}$

16.  $7.73 \times 10^{-3}$   $<$   $25 \times 10^{-2}$   
 $2.5 \times 10^{-1}$

17.  $(3 \times 10^2)^3$   $>$   $(2 \times 10^3)^2$   
 $2.7 \times 10^7$   $4 \times 10^6$

18.  $(2 \times 10^3)^3$   $=$   $(5 \times 10^6)(1.6 \times 10^3)$   
 $8 \times 10^9$   $8 \times 10^9$

19. Convert to scientific notation: 2,870  
 $2.87 \times 10^3$

20. Convert to decimal form:  $3.7 \times 10^{-4}$   
0.00037

Perform the operation. Express final answers in scientific notation. No calculators!

21.  $(6 \times 10^4)(2 \times 10^3)$   $1.2 \times 10^8$

22.  $(8 \times 10^{-5})(6 \times 10^9)$   $4.8 \times 10^5$

23.  $\frac{(6 \times 10^{-2})(2 \times 10^3)}{(3 \times 10^5)(4 \times 10^{-8})}$   $1 \times 10^4$

24. A steady current of 1 ampere flowing through a solution of silver nitrate will deposit  $1.12 \times 10^{-3}$  grams of silver in one second. How much silver will be deposited by 20.0 amperes in one hour?

$20.0 \text{ amp} \mid 1.12 \times 10^{-3} \text{ g}$   $= 2.24 \times 10^{-2} \text{ g}$   
 $\mid 1 \text{ amp}$   $\text{or } .0224 \text{ g}$

Simplify.

1.  $3x + 4x^4 - x^2 + 7 + 2x^3 + x^2 - 4x - 2x^4 + 1 + 5x^3$   $2x^4 + 7x^3 - x + 8$

2.  $(y^2 - 7y + 4) - (3 + 2y - y^2)$   $2y^2 - 9y + 1$

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

4.  $7(c + 2d) - 3(2c + d)$   $c + 11d$

If the statement is true for all real numbers  $a$  and  $b$  and positive integers  $x$  and  $y$ , write "True." Otherwise write "False."

5.  $(a^x)(a^y) = a^{xy}$  False

6.  $(a^m)^n = (a^n)^m$  True

7.  $a^{x+y} = a^x + a^y$  False

8.  $(ab)^m = ab^m$  False

9.  $(a^x)(b^x) = (ab)^x$  True

10.  $(a^u)(a^v) = a^{u+v}$  True

11.  $(a^x)(b^y) = (ab)^{xy}$  False

12.  $2^u \cdot 3^u = 6^u$  True

Simplify.

13.  $(3a^2b)^3$   $27a^6b^3$

14.  $(6x^2y)(-2xy^2)^2$   $24x^4y^5$

15.  $3n^2m^3(m^2n - 2mn^2)$   $3m^5n^3 - 6m^4n^4$

16.  $(3a - 4b)(3a + 4b)$   $9a^2 - 16b^2$

17.  $(2x^2 - y^2)^2$   $4x^4 - 4x^2y^2 + y^4$

18.  $(7xy + 2z^2)^2$   $49x^2y^2 + 28xyz^2 + 4z^4$

19.  $2a(a + 1)(a - 2)$   $2a^3 - 2a^2 - 4a$

20.  $(m^2 - 2m)(m^2 + 2m + 1)$   $m^4 - 3m^2 - 2m$

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

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

Find the GCF and LCM of the monomials.

1. 18, 27

2. 120, 84

3. 24, 36, 60

GCF 9 LCM 54

GCF 12 LCM 840

GCF 12 LCM 360

4.  $8x^3$ ,  $12x$

5.  $18a^2b^3$ ,  $24ab^2$

6.  $5m^4n^2$ ,  $15m^2n^3$

GCF  $4x$  LCM  $24x^3$

GCF  $6ab^2$  LCM  $72a^2b^3$

GCF  $5m^2n^2$  LCM  $15m^4n^3$