

MATH 1220 – Arithmetic and Algebra Review for College Algebra

The following is not meant as an assignment to be collected, but rather reflect much of the arithmetic and basic algebra seen in Math 1220. Success in College Algebra depends on a solid grasp of Intermediate Algebra, which in turn is based on arithmetic skills. These review problems are given so that you can review before the semester starts and be well prepared. The goal of mathematics courses at UNM is to build your skills and strengthen them so that you will be prepared for the next course in the sequence. Review is needed but don't worry if you don't feel fully confident to start with. You'll have opportunity to review as you go. However, if you have not taken a mathematics course for the last three or four semesters, and if you are having difficulty with many of the review problems, you may want to consider retaking Math 1215 so that you are better prepared for Math 1220.

1. Perform the indicated operations without using a calculator. Write your final answer as an integer or as a fraction in lowest terms.

(a) $\frac{1}{3} + \frac{1}{2}$

(b) $2 - \frac{2}{3} + \frac{1}{4}$

(c) $4\left(2 - \frac{2}{3}\right)$

(d) $\frac{12}{\frac{4}{3} + \frac{1}{6}}$

2. Is the inequality true or false?

(a) $-2 < 0$

(b) $5 \geq 5$

(c) $5 > 5$

(d) $3 \leq -10$

(e) $-2 < -6$

3. Express the Inequality in interval notation.

(a) $-1 < x \leq 5$

(b) $x < 3$

(c) $x \geq -4$

4. Express the interval using inequalities.

(a) $(2, \infty)$

(b) $[-3, -1]$

(c) $[0, 9)$

5. Evaluate the expression without using a calculator

(a) $(-3)^4$

(d) $\frac{5^{12}}{5^{10}}$

(b) -3^4

(e) $\left(\frac{3}{4}\right)^{-2}$

(c) 3^{-4}

(f) $16^{\frac{3}{4}}$

6. Simplify the expression. Write your final answer without negative exponents.

(a) $(4x^2y^3)(2xy^2)$

(b) $\left(\frac{5a^{\frac{1}{2}}}{a^2}\right)^2$

(c) $(x^{-2}y^{-3})(xy^2)^2$

7. Expand and Simplify

(a) $4(x+3)+5(2x-1)$

(d) $(a-2b)(a+2b)$

(b) $(x+3)(x-5)$

(e) $(y-3)^2$

(c) $(2x-1)(3x+2)$

(f) $(2x+5)^2$

8. Factor the expression

(a) $4x^2 + 2x$

(c) $x^2 + 8x + 15$

(e) $2x^2 + 5x - 12$

(b) $3xy - 6x^2y$

(d) $x^2 - x - 2$

(f) $x^2 - 16$

9. Simplify the rational expression

(a) $\frac{x^2 + 4x + 3}{x^2 - 2x - 3}$

(c) $\frac{x^2 - x}{x^2 - 9} - \frac{x + 1}{x + 3}$

(b) $\frac{2x^2 - 3x - 2}{x^2 - 1} \cdot \frac{x + 1}{2x + 1}$

(d) $\frac{\frac{1}{x} - \frac{1}{y}}{\frac{2}{xy}}$

10. Simplify: $(8m^3n^6)^{\frac{2}{3}}$

11. Simplify and write your answer without any negative exponents: $\frac{x^{n+4}}{(x^2)^{3n}}$

12. Factor completely: $14x^4 - 5x^3 - x^2$

13. Simplify: $\frac{1}{x+h} - \frac{1}{x}$

14. Simplify: $\frac{x^3 - 16x}{x^3 + 9x^2 + 20x}$

15. Simplify: $\frac{1 - \frac{1}{x}}{\frac{1}{x} - \frac{1}{x^2}}$

16. Find the equation, in slope-intercept form, of the line which passes through the point $(2, -7)$ and has slope $m = -1$

17. Solve, and write your answer in interval notation: $3(4 - x) \geq 12x + 5$

18. Solve the following equations:

(a) $2x^2 = 32x$

(d) $x^2 = 19 + 2x$

(b) $x^2 + 18 = 19x$

(e) $4x^2 - 8x + 1 = 0$

(c) $3x^2 - 5x = 2$

(f) $x^3 + 7x^2 + 12x = 0$

19. The width of a rectangle is 8 feet less than twice the length. Write an equation for the width W in terms of the length L .