

Name: _____

Horace Greeley High School

Mathematics Department

Recommended summer work for students entering **Math 4305 Algebra 2.**

Factoring and Solving Equations

1. Factor completely:

a. $64 - x^2$

b. $3x^3 - 39x^2 + 90x$

c. $5x^3 - 20x^2 - 60x$

2. What is the product of $(3x + 2)$ and $(x - 7)$?

3. What is the Greatest Common Factor of $3m^2n + 12mn^2$?

4. Solve algebraically for x: $3(x + 1) - 5x = 12 - (6x - 7)$

Rational Expressions and Equations

5. Solve algebraically for x: $\frac{3}{x+5} = \frac{2x}{x^2-8}$

6. For which values of x is the fraction $\frac{x^2 + 4x - 12}{x^2 - 2x - 15}$ undefined?

7. Express in simplest form: a.) $\frac{x^2-1}{x^2+3x+2}$ b.) $\frac{x^2-3x-10}{x^2-25}$

8. Find the quotient of: $\frac{8x^5 - 2x^4 + 4x^3 - 6x^2}{2x^2}$

Simplifying Radicals

9. Express in simplest radical form.

a. $2\sqrt{45} =$ _____

b. $\sqrt{63} =$ _____

c. $4\sqrt{90} =$ _____

d. $\frac{1}{3}\sqrt{45} =$ _____

e. $4\sqrt{75} =$ _____

10. Express in simplest radical form.

a. $\frac{3\sqrt{75} + \sqrt{27}}{3} =$ _____

b. $\frac{\sqrt{84}}{2\sqrt{3}} =$ _____

c. $\frac{\sqrt{18}}{\sqrt{2}} =$ _____

d. $\sqrt{2} + \sqrt{50} =$ _____

e. $3\sqrt{32} - 6\sqrt{8} =$ _____

f. $\sqrt{4} \cdot \sqrt{5} \cdot \sqrt{5} =$ _____

g. $(4\sqrt{6})(9\sqrt{3}) =$ _____

Coordinate Geometry

11. What is the slope of the line that passes through the points (2, -3) and (5, 1)?

12. What is the slope of the line with the equation: $2y - 3x = 4$

13. What is the equation of the line that passes through the point (-2, -8) and has a slope of 3?

14. Write the equation of the line that passes through the point (2, -7) and perpendicular to the line $y = -3x + 9$.

Systems of Equations

15. Solve the systems of equations.

a. $y = 4x - 1$

$$2x + y = 5$$

b. $2x + 2y = 9$

$$2x - y = 3$$

Solutions

1. a. $(8 + x)(8 - x)$
b. $3x(x - 10)(x - 3)$
c. $5x(x - 6)(x + 2)$
2. $3x^2 - 19x - 14$
3. $3mn$
4. $x = 4$
5. $x = 12, x = -2$
6. $x = 5, x = -3$
7. a. $\frac{x-1}{x+2}$ b. $\frac{x+2}{x+5}$
8. $4x^3 - x^2 + 2x - 3$
9. a. $6\sqrt{5}$
b. $3\sqrt{7}$
c. $12\sqrt{10}$
d. $\sqrt{5}$
g. $20\sqrt{3}$
10. a. $6\sqrt{3}$
b. $\sqrt{7}$
c. 3
d. $6\sqrt{2}$
e. 0
f. 10
g. $108\sqrt{2}$
11. $4/3$
12. $3/2$
13. $y + 8 = 3(x + 2)$
14. $y + 7 = (1/3)(x - 2)$
15. a) $x = 1, y = 3$
b) $x = 5/2, y = 2$