Algebra 2 Summer Work

Directions: Complete all problems showing your work. **Due the first day of school. Honors:** You will have a test on this content on the third day of classes. If you are unable to earn a B or higher on the assessment, you may be advised to change to the regular level of Algebra 2.

Basic Operations

Evaluate

1) $\frac{-1}{4} \div 5$

2) $-20 + 7 - 3$

3) $-\frac{5}{6} + \frac{6}{5}$

4) $12 \div 3 + 6 \times 17 - 3$

5) $\frac{3(8) - 3^2}{15 \div 5}$

6) Evaluate the expression $xy^2 - z$ if x = 3, y = 4 and z = 2

Combining Like Terms, Solving multi-step equations

1) Simplify: $3y^3 + 2y^2 + 4y^3$

2) Simplify: $9(3x+1)+2$

3) Solve: $\frac{1}{2} - \frac{1}{3}y = 3 + \frac{1}{2}y$

4) Solve: $3(2+d) - 8 = 3d - 2$

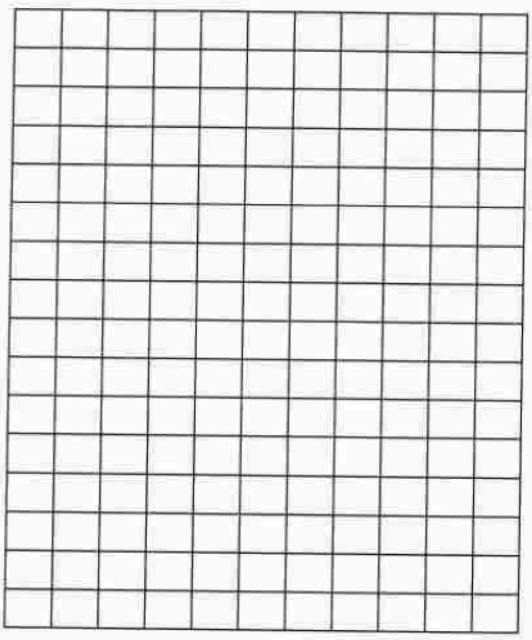
5) Solve: $\frac{-x}{3} - 5 = 14$

6) Solve for a: $\frac{3x-2y}{a} = 4$

Graphing Linear Equations, Finding slope, Writing the equation of a line

1) Graph

a. $y=4x-2$



2) Find the slope of the line that passes through each pair of points (8, - 2), (-3, 7)

Write the slope-intercept form of the equation.

3) a. passes through (4, -6) and is parallel to $x + 2y = 5$

4) b. passes through (-2, 3) and is perpendicular to $y = \frac{1}{4}x - 4$

Solving Systems of Equations using Elimination and Substitution

1) Solve by Elimination:

$$-x + 3y = 6$$
$$x + 3y = 18$$

2) Solve by Substitution:

$$x + 2y = 13$$
$$3x - 5y = 6$$

Multiplying Polynomials

Find each product

a. $5x(-x^2 - x + 4)$

b. $y(-5y + 2) + 6y$

c. $(2x - 7)(3x + 4)$

Properties of Exponents

1) $(3cd)^2(2c^3d^2)^2$

2) $3^{-2}y^0x^2$

3) $\dfrac{-2(x^3y)^2}{8x^5y}$

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

5) $\frac{x^{\frac{3}{4}}y^{\frac{2}{5}}}{x^{\frac{1}{4}}y^{-\frac{1}{5}}}$

Rewriting Rational Exponents as Radicals and Vice Versa

For #1 and #2, rewrite in radical form with positive exponents

1. $y^{\frac{3}{2}}$

2. $\frac{1}{x^{-\frac{4}{3}}}$

For 3 and 4, rewrite in exponent form

3. $\sqrt[5]{x^7}$

4. $\sqrt[4]{y^3}$

FACTORING: Using GCF, By Grouping, AC Method

1) $18a^2bc^2 - 48abc^4$ (using GCF)

2) $18y^2 - 30y - 3y + 5$ (Factor by Grouping)

3) $g^2 - 19g + 60$ (Simple trinomial factoring)

4) $3d^2 + 5d + 2$ (AC Method)

5) Solve: $b^2 + 20b + 36 = 0$ (Solving Quadratic By Factoring)

Solving Quadratics

1) $r^2 + 9 = 0$ (Solve Using Square Roots)

2) $x^2 - 9x + 4 = 24$ (Solve By Completing the Square)

3) $3x^2 - 5x = 12$ (Solve using the Quadratic Formula)

Operations with Radicals

1) $\sqrt{18}+\sqrt{12}-3\sqrt{8}$ (Simplifying, Adding, Subtracting)

2) $\sqrt{20a^6b^5c^2}$ (Simplifying Radicals w/ variables)

3) $\sqrt{5}(3\sqrt{10}+\sqrt{15})$ (Multiplying Radicals)

4) $3\sqrt{48}$ (Simplifying)

5) Solve: $\sqrt{3x-1}=5$ (Solving a radical equation)

Graphing Quadratics

If $y = x^2 + 4x - 12$

a. Find the vertex: (,)

b. State the axis of symmetry

c. Find the x-intercepts:

d. Graph using the points above