Name _____Course_____Date ____

Math 9 Honors – Summer Review

A. Factor completely:

1) $n^2 - 11n + 24$

2) $x^2 + 4xy - 45y^2$

3) $x^2 - 16$

4) $2x^2 + x - 6$

5) $12x^6y^2 - 20x^2y^5$

6) $3n^2 - 75$

7) $x^4 - 81$

8) $27 + 12x^2 - 36x$

9) $-243x^3 - 48x + 216x^2$

10) $\frac{25}{3}x^2 - \frac{1}{3}y^2$

11) $x(x - 2) + 3(x - 2)$

12) $24x^2 - 37x - 72$

B. Solving quadratic equations. Find the roots.

1) $x^2 - 7x - 18 = 0$

2) $2n^2 + 5n - 3 = 0$

3) $2y^2 = 7y$

4) $6x^2 = 13x + 5$

5) $x^2 + \frac{1}{2}x - 14 = 0$

6) $25x^2 - 81 = 0$

7) $\frac{1}{2}x^2 = 40$

8) $x^3 = 121x$

9) $\frac{x+6}{7} = \frac{x}{x-4}$

10) $x(x - 2) - 6(x - 2) = 0$

11) $x^2 + 9x = 14$

12) $6x^2 - 2x = 5$

C. Find the axis of symmetry, roots, and vertex of the graph of the function.

1) $y = 2x^2 - 8x + 6$

2) $y = -3x^2 + 24x - 22$

D. Find the value of the longest side of the triangle:

1) In a right triangle, the length of one leg is 6 and the length of the hypotenuse is 10. Find the length of the third side.

2) In a right triangle, the length of one leg is *x*, the length of the second leg is *(x +1)* and the length of the hypotenuse is *(2x - 1)*. Find the length of the hypotenuse.

E. Slope and Equations of a line:

1) Write an equation for the line:
   a. Passing through (-2, 3) and parallel to y = 6
   b. Passing through (0,8) and perpendicular to x = -4
   c. Passing through (2,3) and parallel to 3y+2 = 2x - 4

2) Determine whether the following lines are perpendicular: *2y + x = -12, 2y = 3x + 8*

F. Simplify. Express each of the following in simplest form. Show your work.

1) $\sqrt{32}$ 2) $\sqrt{75}$ 3) $\sqrt{700}$

4) $5\sqrt{12}$ 5) $\frac{1}{2}\sqrt{72}$ 6) $\sqrt{15}\cdot\sqrt{3}$

7) $2\sqrt{5}\cdot 6\sqrt{5}$ 8) $\sqrt{4^2}\cdot(\sqrt{3})^2$ 9) $\frac{3}{\sqrt{18}}$

10) $(2\sqrt{7})^2$ 11) $\frac{2\sqrt{3}-\sqrt{12}}{\sqrt{3}}$ 12) $5\sqrt{\frac{4}{15}}$

13) $6\sqrt{6}+\sqrt{54}$ 14) $\sqrt{2}(2\sqrt{2}+3\sqrt{3})$ 15) $(-4\sqrt{2})(-3\sqrt{40})$

16) $5\sqrt{27}-\sqrt{108}-3\sqrt{75}$

F. Solve each system of equations <u>algebraically</u>.

1) $3x + 2y = 3$
   $5x - 3y = -14$

3) $\frac{3}{8}x - \frac{5}{4}y = 7$
   $\frac{1}{3}x + 5y = 16$

2) $x = 1.2y - 3.2$
   $1.5x + 2y = 18$

4) $y = 4x^2 - 16x + 17$
   $y = 4x + 1$