Name _____ Date _____

Algebra II CC – Midterm Review #2 Period _____

UNIT 3: RATIONAL EXPRESSIONS & EQUATIONS

1. Simplify: $\dfrac{3x-4x^2}{8x^2-2x-3}$

2. Perform the indicated operation and express in simplest form:

$$\frac{c^3-9c}{2c^2+7c+3} \div \frac{5c-15}{4c^2-1}$$

3. Perform the indicated operation and express in simplest form:

$$\frac{3}{x^2+5x-14} - \frac{2}{x^2+8x+7}$$

4. Simplify: $\dfrac{\frac{x^2}{16}-1}{\frac{x}{8}-\frac{1}{2}}$

5. Solve for r algebraically: $\frac{3}{5r} - \frac{1}{3r} = \frac{1}{15}$

6. Solve for all values of x: $\frac{2}{x-2} + \frac{x-4}{x-1} = \frac{2x+1}{x^2-3x+2}$

7. Solve for x: $x = \sqrt{3x+16} - 2$

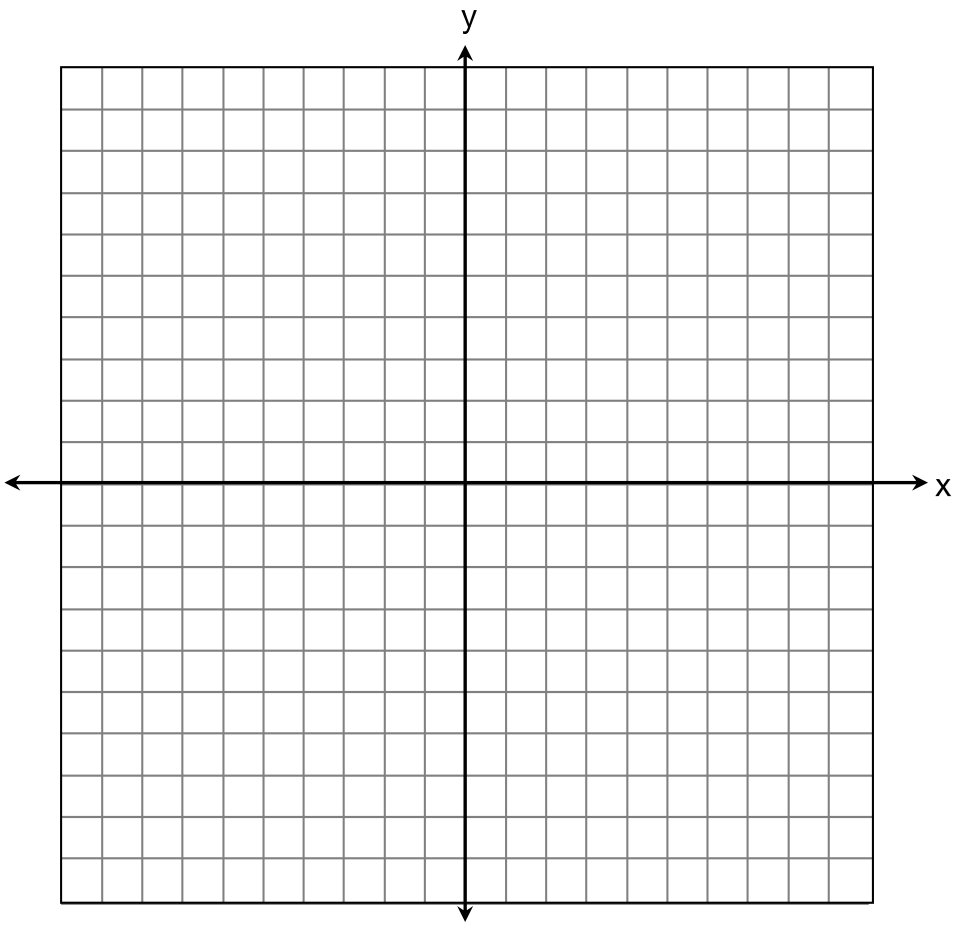
8. Solve for x and express the roots in simplest $a+bi$ form: $3x^2 + 3 = 5x$

9. Determine the solution set of the system of equations:

$$x + y + z = 5$$
$$2x - y + z = 9$$
$$x - 2y + 3z = 16$$

10. On the set of axes below, solve the following system of equations for x and y.

$$(x+1)^2 + (y-3)^2 = 16$$
$$y - x = 8$$



11. What is the solution set of the following system of equations:

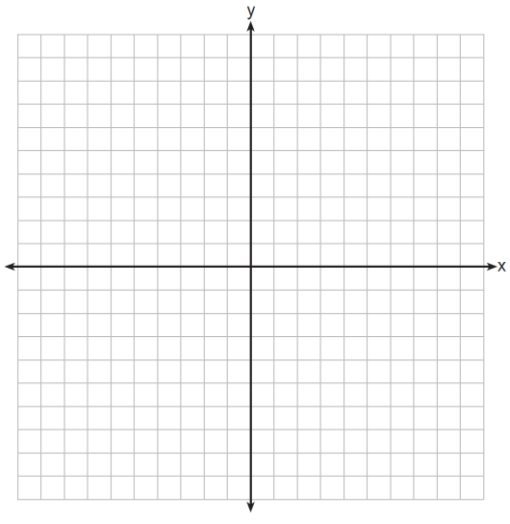
$$y = (x+2)^2 - 4$$
$$y - 3x = 2$$

(1) (–2,1)
(2) (5,–4)
(3) (–2,–4) and (1,5)
(4) (–4,–4) and (5,5)

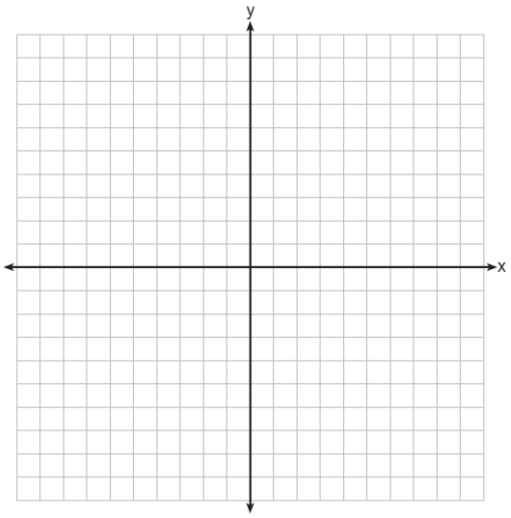
12. Solve the following system of equations for all values of x and y:

$$x^2 + y^2 - 40 = 0$$
$$y - 3x = 0$$

13. Write the equation of the parabola whose focus has the coordinates (–4,–4) and whose directrix has the equation $y = 6$.



14. The equation of a parabola $16(y+1)=(x+4)^2$ has a directrix represented by $y=-5$. Determine the coordinates of the focus of the parabola.



15. Express in simplest $a + bi$ form: $-3i^6(4x-2i^{13})-(x-7i)$

16. Multiply $(3x-i)(2x-4i)$ and express in simplest $a + bi$ form.

17. Determine all solutions to the equation $x^4+13x^2+12=0$ and express the solutions in simplest form in terms of i.

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1. What is the solution set of $\sqrt{34-x} = x-4$?

   (1) $\{-2,9\}$ (3) $\{9\}$

   (2) $\{-2\}$ (4) $\{-9,2\}$

2. The solutions of the equation $x^2 - 4x + 20 = 0$ are

   (1) $2 \pm 4i$ (3) $4 \pm 8i$

   (2) $-2 \pm 4i$ (4) $-4 \pm 8i$

3. When simplified, the fraction $\dfrac{\frac{1}{x} - \frac{1}{y}}{\frac{y}{x} - \frac{x}{y}}$ is equivalent to

   (1) $\dfrac{1}{x+y}$ (3) $-\dfrac{1}{x+y}$

   (2) $\dfrac{1}{x-y}$ (4) $-\dfrac{1}{x-y}$

4. How many solutions does the system whose equations are $x^2 + y^2 = 4$ and $x = -2$ have?

   (1) one (3) three

   (2) two (4) zero

5. Perform the indicated operation and express in simplest form:

$$\frac{x^2 - 5x - 14}{3x^3 - 2x^2 - 12x + 8} \div \frac{6 + 9x}{4 - 9x^2}$$

6. Solve for x: $\dfrac{x+1}{x+2} - \dfrac{2}{x} = \dfrac{-4}{x^2+2x}$

7. Express $(3i)^2(-2i)(x-8i)$ in simplest $a+bi$ form.

8. Solve the system of equations algebraically for x and y:
$$y - 2x = 2x^2 + 3$$
$$x = y - 3$$

9. Solve algebraically for x: $2x^3 - x^2 + 18x + 9 = 0$