Algebra II Homework #16

1) Solve: $\dfrac{2}{x-12} = \dfrac{32}{x^2-8x-48} - \dfrac{4}{x+4}$

2) If Joe can finish his homework all by himself in 3 hours but can finish it in 1 hour when he works together with Silas, how long would it take Silas to finish that homework on his own?

3) Solve: $\dfrac{1}{12my} + \dfrac{5}{18ax} = \dfrac{2}{27mx}$ for a.

4) Emily and Tristan decide to bake cookies for a church event. They can't stop baking until they have 54 cookies on the serving tray. Unfortunately for Emily, Tristan is only interested in eating the cookies. If Tristan can eat 15 cookies in 2 hours and Emily can bake 12 cookies in 1 hour, how long will they be baking if Tristan eats the cookies while Emily bakes them?

5) Solve: $\dfrac{25}{x+5} + 2x = \dfrac{x^2}{x+5}$

6) Solve $3x^2 - 6x = 3$ by completing the square and then verify your solutions using the quadratic formula.

7) Put the equation $y = 3x^2 - 6x - 5$ in standard form, find the vertex, find the axis of symmetry, find the maximum or minimum value, state whether the graph is "skinny" or "fat" and by what factor, and graph the equation.

8) Gianna wants to build a fence around part of her backyard so that her dog can go outside without running away. Gianna has 240 feet of fence and will use the back of her house as one side of the rectangular enclosure. Use completing the square to determine the dimensions (length and width) of the enclosure in order to maximize the area AND determine how much area this new fence provides for her dog.

9) Solve $5x^2 - 3x = 7$ by completing the square and then verify your solutions using the quadratic formula.

10) Put the equation $y = 4x^2 + 5x - 1$ in standard form, find the vertex, find the axis of symmetry, find the maximum or minimum value, state whether the graph is "skinny" or "fat" and by what factor, and graph the equation.

11) Emma launches a model rocket with an initial velocity of 180 feet per second from a platform 9 feet off the ground. Find the equation for the flight path of the rocket where x stands for the time, in seconds, after launch and y stands for the height, in feet, of the

rocket. Use completing the square to determine how many seconds after launch the rocket got to its maximum height AND determine the maximum height of the rocket.

12) Solve $4x^2 + 12x = 5$ by completing the square and then verify your solutions using the quadratic formula.

13) Put the equation $y = -5x^2 - 8x + 3$ in standard form, find the vertex, find the axis of symmetry, find the maximum or minimum value, state whether the graph is "skinny" or "fat" and by what factor, and graph the equation.

14) Audrey wants to build a rectangular corral around part of her backyard using 860 feet of fence so that her horses have a place to graze. Use completing the square to determine the dimensions (length and width) of the enclosure in order to maximize the area AND determine how much area this new fence provides for her horses.

15) Solve $-3x^2 = 7x + 1$ by completing the square and then verify your solutions using the quadratic formula.

16) Put the equation $2y = x^2 + 10x + 3$ in standard form, find the vertex, find the axis of symmetry, find the maximum or minimum value, state whether the graph is "skinny" or "fat" and by what factor, and graph the equation.

17) Ronnie throws a baseball into the air with an initial velocity of 60 feet per second from a height of 7 feet off the ground. Find the equation of the flight path of the baseball where x stands for the time, in seconds, after he releases the ball and y stands for the height, in feet, of the ball. Use completing the square to determine how many seconds after the ball is released that it got to its maximum height AND determine the maximum height of the baseball.

18) Solve $7x^2 + 14x = 6$ by completing the square and then verify your solutions using the quadratic formula.

19) Put the equation $y = -7x^2 + 9x - 8$ in standard form, find the vertex, find the axis of symmetry, find the maximum or minimum value, state whether the graph is "skinny" or "fat" and by what factor, and graph the equation.

20) Kristin wants to create an open, rectangular box out of a piece of paper that is 12 inches wide by cutting square pieces out of each corner of the paper and folding up the sides so that the length of the bottom of the box is 18 inches long. Use completing the square to determine how large she should make each square (the length of the side of each square) in order to maximize the volume inside the box AND determine what the volume of that box would be.