MATH 120
WINTER 2015 NAME:
EXAM 2

1. [10 pts. each] Solve the quadratic equation.
   (a) $5x^2 - 2 = 3x$ (by factoring)
   (b) $x^2 - 3x - 6 = 0$ (by completing the square)

2. [15 pts.] A rectangular piece of metal is 10 cm longer than it is wide. Squares with sides 2 cm long are cut from the four corners, and the flaps are folded upward to form an open box. If the volume of the box is 832 cm^3, what were the original dimensions of the piece of metal?

3. [15 pts.] A rectangular parcel of land is 6 meters longer than it is wide. Each diagonal from one corner to the opposite corner is 174 meters long. What are the dimensions of the parcel?

4. [10 pts.] Darth Vader and Emperor Palpatine are drafting architectural plans for a Death Star. Emperor Palpatine can independently complete the job in 280 hours. Darth Vader can independently complete the job in 700 hours. If they work together, then how long will it take for them to complete the job?

5. [10 pts. each] Solve each equation.
   (a) $\dfrac{x+5}{x-2} = \dfrac{5}{x+2} + \dfrac{28}{x^2-4}$
   (b) $\sqrt{2x} - x + 4 = 0$
   (c) $\sqrt{x} - \sqrt{x+3} = -1$
   (d) $x^4 - 5x^2 + 4 = 0$
   (e) $|8 - 2x| = 42$

6. [10 pts. each] Solve each inequality. Write each solution set in interval notation.
   (a) $6x - (2x - 3) \geq 3x + 5$
   (b) $-3 < \dfrac{x-4}{6} < 2$
   (c) $6x^2 - 11x < 10$
   (d) $2x^3 - 3x^2 - 5x \leq 0$
   (e) $\dfrac{10}{2x-3} \leq 5$
   (f) $|8x - 3| > 13$

7. [10 pts.] Find the distance between $(-6, 5)$ and $(8, -2)$.

8. [10 pts.] Write $x^2 + y^2 + 8x - 6y + 16 = 0$ in Center-Radius form, then give the center and radius of the circle.