

MATH 120
FALL 2013
EXAM 2

NAME:

- 10 pts. each Solve each equation by the indicated method.

 - $6x^2 + 5x = 4$ (by factoring)
 - $3x^2 = 6x + 1$ (by completing the square)
- 10 pts. Solve $h = -16t^2 + v_0t + s_0$ for t using the quadratic formula.
- 15 pts. An inlet pipe can fill a pool in 7 hours, and an outlet pipe can empty the pool in 9 hours. How long would it take to fill the pool if both pipes are left open?
- 15 pts. A can of pinto beans has surface area 371 cm^2 , and its height is 12 cm. What is the diameter of the circular top? Round to the nearest hundredth.
- 10 pts. each Solve each equation.

 - $\frac{1}{x-1} = \frac{2}{x^2}$
 - $\frac{x+5}{x-2} = \frac{5}{x+2} + \frac{28}{x^2-4}$
 - $\sqrt{5-x} + 1 = x - 2$
 - $3 - \sqrt{x} = \sqrt{2\sqrt{x} - 3}$
 - $3x^4 + 10x^2 - 25 = 0$
 - $|x - 1| = |11 - 5x|$
- 10 pts. each Solve each inequality. Write each solution set in interval notation.

 - $6x - (3 - 2x) \leq 3x - 7$
 - $-\frac{1}{2} < \frac{4 - 3x}{5} \leq \frac{1}{4}$
 - $x^2 + 5x + 6 < 0$
 - $\frac{x+1}{x-5} \geq 4$
 - $|4 - 3x| > 2$
 - $|x - 3| > 0$
 - $|5 - x| \leq 12$

7. 10 pts. Write $x^2 + 5x + y^2 - 6y = 3$ in Center-Radius form, then give the center and radius of the circle.
8. 10 pts. Suppose that receiving stations S_1 , S_2 , and S_3 are located on a coordinate plane at the points $(2, 4)$, $(1, -3)$, and $(-3, -6)$, respectively. The epicenter of an earthquake is determined to be 5 units from S_1 , 5 units from S_2 , and 10 units from S_3 . At what coordinates is the epicenter located?

EXTRA CREDIT. 10 pts.

A problem from the ancient Chinese work *Arithmetic in Nine Sections*: There is a bamboo 10 feet high, the upper end of which, being broken, reaches the ground 3 feet from the stem. Find the height of the break.

