Winter 2014 Math 123a FINAL Name: _____

Show all necessary work neatly, clearly, and systematically. Any understatement and/or incorrect statement may be penalized. There is a total of 105 points available to grab. Good Luck! BOX YOUR FINAL ANSWERS

1. (2) Compute: $\left(-\frac{3}{8}\right)^2 \cdot \left(-\frac{2}{3}\right)^3$

2. (2) Compute: $\frac{5}{6} - \frac{4}{5}\left(\frac{3}{4} - \frac{5}{6}\right)$

3. (2) Solve: $5x - 2(x-7) = 10 + 7x$

4. (2) What percent of 25 is 62.5?

5. (3) Solve: $\frac{2}{3}(2x-5) - \frac{5}{6} = \frac{3}{4}x - \frac{5}{8}$

6. (2) Solve: $-33.68 = -7.7x + 4.9$

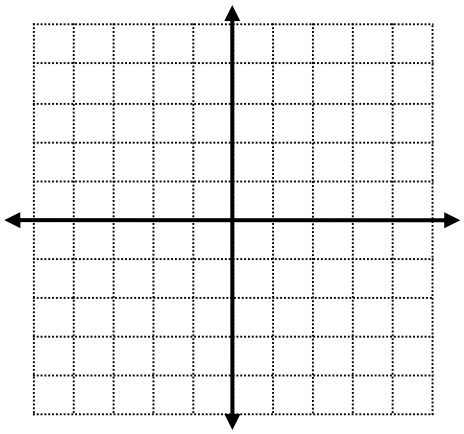
7. (3) Solve and graph the solution:
$3(x+1.2) \le 0.5x - 5.3$

8. (3) Solve: $3(x-9)+30x \le -5(-7x-3)-3x$. Write your solution in interval notation.

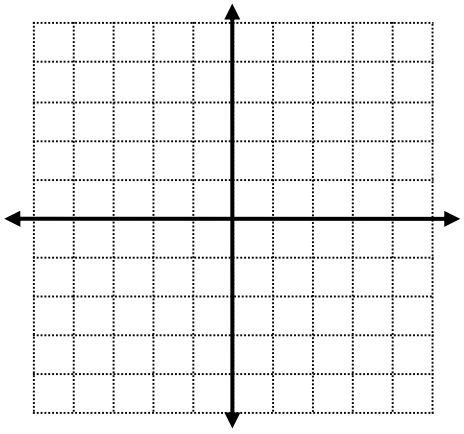
9. (2) A line with slope $\frac{2}{7}$ contains (3,-4). Find the equation of the line.

10. (3) Find the equation of a line that contains (5,-6) and (9,-1). Write your answer in slope-intercept form, then convert to standard form.

11. (2) Graph: $y = -\frac{2}{3}x + 1$



12. (2) Graph: $2x - 3y = -6$



13. (2) Simplify: $\frac{(2x^2y)^4(xy^4)^2}{4(xy)^3}$

14. (4:1,2,1) Line A has an equation $5x+2y=-27$. Line B, containing (-5,-2) is perpendicular to Line A.

a. Rewrite Line A in slope-intercept form.

b. Find the slope of Line B. Note: Two lines are perpendicular if the product of the slopes is -1.

c. Find the equation of Line B.

15. (2) Simplify: $\dfrac{9x^2\left(2x^{-4}\right)^3}{4\left(3x^3\right)^{-2}}$

16. (2) Multiply: $\left(2x-3\right)\left(x^2-4x+5\right)$

17. (3) Divide: $\dfrac{x^2+8x+9}{x+6}$

18. (4) Divide: $\dfrac{3x^3-x-8}{x-3}$

19. (2) Simplify: $\left(3x-2\right)^3$

20. (3) Factorize: $5x^3y-39x^2y^2-8xy^3$

21. (2) Factorize: $2x^3 - 128x$

22. (2) Factorize: $2x^3 - 128$

23. (3) Solve: $4x^3 + 1 = 4x^2 + x$

24. (2) Solve: $8x^3 + 80x^2 + 72x = 0$

25. (2) Solve: $\frac{2}{x} = \frac{x}{5x - 12}$

26. (4) Solve: $(3x - 7)^2 + 5(3x - 7) + 6 = 0$

27. (3:1,2) Let $y = x^2 - 7x + 10$.

a. Find the y-intercept.

b. Find the x-intercepts.

28. (2) Solve for g: $T = fm - gm$

29. (2) Solve for m: $T = fm - gm$

30. (2) Simplify: $\dfrac{x^2-9x}{9-x}$.

31. (3) Multiply: $\dfrac{x^2-3x-10}{x^2-5x}\cdot\dfrac{x+2}{x^2-4}$.

32. (4) Divide: $\dfrac{x^2-5x-14}{x^2-9x+14}\div\dfrac{x^2+6x+8}{x^2+2x-8}$.

33. (4) An auto shop charged a customer a total of \$348 to repair a car. The bill listed \$68 for parts and the remainder for labor. If the cost of labor is \$40 per hour, how many hours of labor did it take to repair the car? Do in 4-step method.

34. (5) How much pure water should be mixed with 80 pints of 35% saline solution to produce a mixture of 14% saline solution? Do in 4-step method.

35. (5) How many gallons of fuel costing $4.10/gallon should be mixed with 20 gallons of fuel costing $3.80/gallon to obtain a mixture costing $4.00/gallon? Do in 4-step method.

36. (5) The length of a rectangular room is 5 ft more than twice the width. If the area of the room is 75 ft^2, find the length and width of the room. Do in 4-step method.

37. (5) The longer leg of a right triangle is 7 in more than the shorter leg. The hypotenuse is 3 in more than twice the shorter leg. Find the lengths of the sides of that right triangle. Do in 4-step.