Math 146/141 Common Final Exam
Sample 3

01)   Graph the linear inequality. $5x - 3y < 18$

02)   Graph.   Label the vertex.
$y = x^2 + 4x - 1$

03)   Graph.   Label the center. $x^2 + y^2 - 2x + 4y = 4$

04)   Multiply. $(2y - 3)(y + 2)^2$

05)   Divide the polynomials. $\dfrac{x^3 + 3x^2 - 2x - 8}{x + 4}$

06)   Find the equation of the line that contains the points $(-3, 4)$ and $(2, -6)$.
Write the answer in slope/intercept form.

07)   Rationalize the denominator. $\dfrac{7\sqrt{2}}{3 + \sqrt{2}}$

08)   Suppose that $f(x) = x^2 - 2x + 4$ and $g(x) = 4 - x$.
Find $f(-2) + g(-2)$.

09)   Suppose that Armen is twice as old as Sophia.   In three years the sum
of their ages will be 54.   How old is each of them now?

10)   The sum of the reciprocals of two consecutive even integers is $\dfrac{5}{12}$.
Find both integers.

11)   Factor completely. $16 - a^4$

12)   Factor completely. $4b^3 - 20b^2 - b + 5$

13)   Factor completely. $27x^3 + 64$

14)   Simplify.   Write the answer as a fully reduced fraction. $\dfrac{1024 \div 8 \cdot 4 + 4}{300 - 2^3 - 2^4}$

15)   Simplify. $6\sqrt{18} - \sqrt{32} + 5\sqrt{8}$

16)   Simplify.   Write the answer with positive exponents only. $\dfrac{(x^{-6})^3 (x^4)^{-2}}{(x^{-10})^{-3}}$

17) Simplify. $\sqrt{\dfrac{36x^5y^8}{18}}$

18) Combine the fractions. Reduce the answer fully. $\dfrac{6}{x^2-9}-\dfrac{5}{x^2-x-6}$

19) Simplify. $\dfrac{1-\frac{1}{x}-\frac{6}{x^2}}{4-\frac{9}{x}-\frac{9}{x^2}}$

20) Solve the inequality. Graph on the number line provided.
$.3(4-x)-.2(x+1)>-.5$

21) Solve the absolute value inequality. Graph on the number line provided.
$|2x-1|\ge 3$

22) Solve the system of equations. You may use any method.
$3x-2y=8$
$4x+y=7$

23) Solve for x. Give all answers whether real or complex. $9x^2-12x+5=0$

24) Solve for y. $\sqrt{y}=y-2$

25) Solve for x. $\dfrac{x^2-9}{x+2}=1-\dfrac{5}{x+2}$