Key

st semester Final Exam review # 3 2012

dvanced Algebra 2:

Write an explicit formula for problems 1 & 2

1. -12,-3,6,15,24,... $a_n = -12 + 9(n-1)$
2. First term of 6 and a common ration of -4 $a_n = 6(-4)^{n-1}$
3. Find the 12th term of the sequence 16,13,10,... -17
4. Find the 37th term of the arithmetic sequence in which $a_3 = 15$ *and* $a_6 = 39$ 87
5. Find the 10th term of the sequence 0.25,1,4,16,... 65,536
6. Find S_{30} in the arithmetic series with $a_1 = 15$ and $a_{30} = 521$ 8,040
7. Evaluate the sum $\sum_{n=1}^{20}(6n - 52)$ 220
8. Evaluate the sum given: 32,16,8,... find S_{10} 63.9375
9. In the month of June, Becca saved 1 quarter the first day, 3 quarters the 2nd day, 5 quarters the 3rd day, and so on. How much MONEY did she save in the month of June? (June has 30 days) $225
10. The table below gives the price of a hamburger at a diner for selected years.

Year	1950	1955	1963	1969	1975	1982	1995	1998
Price $	0.25	0.35	0.40	0.50	0.75	1.25	1.75	1.95

L1 L2 STAT CALC lin linear regression

Let x represent years since 1900 and let y represent the cost of a hamburger in dollars. Find the least squares line and use it to estimate to the nearest cent, the price of a hamburger at this diner in 1990. $y = .036657936x - 1.789780283$ $1.51

Write the equation of the following lines:

11. Passing through the points (-2,5) and (1,7) **Standard Form** $2x - 3y = -19$
12. Passing through the point (-2,8) with m=5 **Slope intercept form** $y = 5x + 18$
13. Passing through the point (1,-4) parallel to 2x-4y=7 **Point Slope form** $y + 4 = \frac{1}{2}(x-1)$
14. Passing through the point (5,1) perpendicular to 3x+y=-8 **Point Slope form** $y - 1 = \frac{1}{3}(x-5)$

Solve the following:

15. $2(x+3) - 4x = 17$ $x = -11/2$
16. $4x + 2 \le 22$ *and* $3x - 5 > 31$ $\varnothing$
17. Solve for x: $3xy - 4z = 15$ $x = \frac{15+4z}{3y}$
18. $|2x + 5| > 7$ $x > 1$ or $x < -6$
19. $|x - 5| \le 10$ $-5 \le x \le 15$
20. $\begin{cases} 2x - 4y = 10 \\ 5x + y = 3 \end{cases}$ (1,-2)
21. $\begin{cases} 2x - 5y + z = -13 \\ x + y + z = 6 \\ 2y - 4z = -10 \end{cases}$ (-1,3,4)
22. $2x^2 - x - 10 = 0$ $x = \{\frac{5}{2}, -2\}$
23. $x^2 + 2x = -5$ $x = -1 \pm 2i$

Simplify:

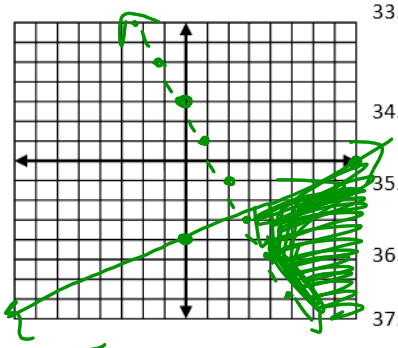
24. $\left(\frac{3x}{2y}\right)^2 = \frac{9x^2}{4y^2}$
25. $\sqrt[3]{-54x^5y^4} = -3xy\sqrt[3]{2x^2y}$
26. $(3x^0y^2)^4 = 81y^8$
27. $\left(\frac{4x^{-2}y^3}{3x^4y^{-2}}\right)^3 = \frac{64y^{15}}{27x^{18}}$
28. $60 \div 4(7 + 3 - 5) - (3^{(5-2)} + 1)$ 47
29. Which property is this? x+(4-x)=x+(-x+4) commutative prop of addition

Graph:

30. $\begin{cases} 4x + 2y > 6 \\ x - 2y \geq 8 \end{cases}$

$\frac{2y}{2} > \frac{-4x}{2} + \frac{6}{2}$

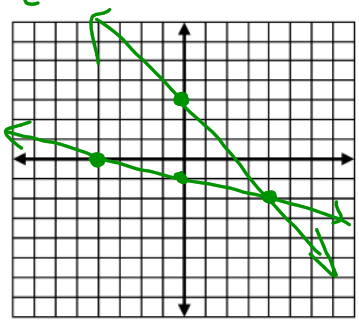
$y > -2x + 3$



31. $\begin{cases} 5x + 4y = 12 \\ x + 4y = -4 \end{cases}$

$\frac{4y}{4} = \frac{12}{4} - \frac{5x}{4}$

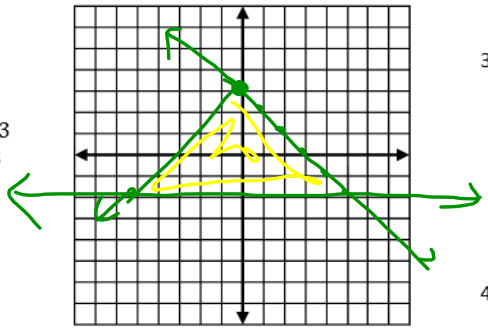
$y = -5/4x + 3$



Solution: (4,-2)

32. A) Graph the set of constraints below, find the corner points of the feasible region.

$\begin{cases} y \geq -2 \\ y \leq -x + 3 \\ y \leq x + 3 \end{cases}$



Corner points: (5,-2), (-5,-2), (0,3)

B) Find the maximum and Minimum values of C=80x+75y on the feasible region.

Maximum: 250

Minimum: -550

x	y	80x+75y
5	-2	80(5)+75(-2) = 250
-5	-2	80(-5)+75(-2) = -550
0	3	80(0)+75(3) = 150

33. What should be added to each side of $x^2 + 13x + 2 = 0$ to complete the square? 169/4

34. i^{233} = i

35. $\frac{3+4i}{2+2i}$ $\frac{7}{4} + \frac{1}{4}i$

36. $(5 + 7i)^2$ -24+70i

37. Find the following for

$f(x) = 2x - 5 \qquad g(x) = x^2 + 2$

a) $f(-3)$ = -11

b) $g(5)$ = 27

c) $f \circ g(x)$ = $2x^2 - 1$

d) $g \circ f(-2)$ = 83

38. Find the discriminant and state the number of solutions and what type they are.

a) $3x^2 - x + 2 = 0$
-23, 2 imaginary solutions

b) $5x - x^2 = 3$
13, 2 irrational roots

c) $6 - x^2 = x$
25, 2 rational roots

39. Solve:

a) $(x-2)^2 - 3 = 9$
x = -2 ±2√3

b) $x^2 - 7x + 6 = 0$
x = 6, 1

c) $4x^2 = 3x - 2$
x = (3 ±i√23)/8

d) $8x^3 + 125 = 0$
x = -2.5, (5 ±5i√3)/4

e) $x^3 - 7x^2 + 15x = 9$
x = 1, 3(multiplicity 2)

f) $x^5 - x^3 - 12x = 0$
x = 0, ±2, ±i√3

40. Factor completely:

a) $27y^3 - 8$
= $(3y-2)(9y^2+6y+4)$

b) $4x^2 + 10x - 3$
= prime

c) $3y^3 + 6y^2 - 9y$
= 3y(y+3)(y-1)

d) $y^4 - 2y^2 - 8$
= $(y+2)(y-2)(y^2+2)$

e) $36x^2 - 49y^2$
= (6x+7y)(6x-7y)

f) $2x^2 + 13xy + 6y^2$ = (2x+y)(x+6y)

41. Divide using synthetic division $(x^3 - 5x + 8) \div (x - 2)$ = $x^2 + 2x - 1 + 6/(x-2)$

42. Divide: $(2x^4 - x^3 + 2x^2 - 7x + 3) \div (2x - 1)$
= $x^3 + x - 3$