Final Exam Review

Comulctive Review Chapters 1–10 (pg 706)

- Clearly show your work and check your answers
- START FILLING IN YOUR 3X5 CARD
- SEE ME WITH ANY CONCEPTS YOU DO NOT UNDERSTAND,

MS GROVES

UPDATED MAY, 2015

CHAPTER 7: SYSTEMS

Solve systems – 3 methods

1. GRAPHING
2. SUBSTITUTION
3. ELIMINATION

(24) Solve by substitution

$y = 5x - 4$ substitute

$-4x + y = -2$

STEP 1 substitute

$-4x + (5x - 4) = -2$

$x - 4 = -2$

$x = 2$

STEP 2 Solve for other var.

$y = 5x - 4$

$y = 5(2) - 4$

$y = 6$

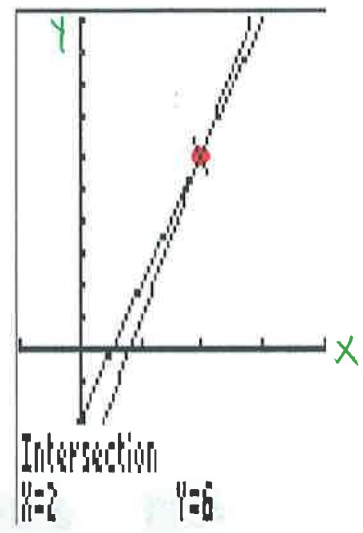
ELIMINATION METHOD

Solve the linear system.

24. $y = 5x - 4$
$-4x + y = -2$

SOLVE BY GRAPHING

$Y_1 = 5X - 4$
$Y_2 = 4X - 2$



SOLUTION as an order pair (2,6)

C: $6 = 5(2) - 4$
$6 = 6$ ✓

C: $6 = 4(2) - 2$
$6 = 6$ ✓

25. $\begin{matrix} x - 4y = -44 \\ -3x + 12y = 132 \end{matrix}$ ×3

$3x - 12y = -132$
$-3x + 12y = 132$

$0 = 0$

X = INFINITE SOLUTIONS

* IF THE VARIABLES DROP OUT AND THE NUMBERS ARE NOT EQUAL THEN

X = NO SOLUTION

26. $\begin{matrix} -4x + 7y = -33 \\ -3x + 2y = -15 \end{matrix}$ ×3, ×−4

$-12x + 21y = -99$
$12x - 8y = 60$

$\frac{13y}{13} = \frac{-39}{13}$

$y = -3$

FIND X:

$-4x + 7(-3) = -33$

$-4x - 21 = -33$
$+21 \quad +21$

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

$x = 3$

SOLUTION (3, −3)

C: $-4(3) + 7(-3) = -33$
$-33 = -33$ ✓

C: $-3(3) + 2(-3) = -15$
$-15 = -15$ ✓

Chapter 8 - Exponents

Know These rules

$x^2 \cdot x^3 = x^5$

$(x^2)^3 = x^6$

$x^0 = 1$

$\frac{x^6}{x^2} = x^4$

NEGATIVE ⟶ POSITIVE EXPONENTS

$\frac{1}{x^2} = x^{-2}$

$x^{-3} = 1/x^3$

$\frac{6x^{-2}}{y^{-5}} = \frac{6y^5}{x^2}$

Simplify the expression.

27. $(-9r)^3$

** $(-9)^3 r^3$

* $-729r^3$

28. $(2p^4)^3 \cdot p^7$

** $2^3 p^{12} \cdot p^7$

* $8p^{19}$

always write answers * vs **

29. $\frac{(3x)^4 y}{xy^3}$

$\frac{3^4 x^4 y}{x y^3} = 81x^3 y^{-2}$

OR

$\frac{81x^3}{y^2}$

** These are written as powers

* These are simplified

Add Like terms
Put in STANDARD FORMAT
- H → L EXPONENT
- Constant Last

Find the sum or difference

33. $(x^2 - 3x + 8) + (-2x^2 + 15x + 4)$

$-x^2 + 12x + 12$

34. $(5m^2 - 6) - (8m^3 + m^2 - 2m + 11)$

① Rewrite as an addition problem

-1

$+ \quad - \quad - \quad + \quad -$

$5m^2 - 6 - 8m^3 + m^2 + 2m - 11$

② Then ADD

$-8m^3 + 4m^2 + 2m - 17$

MULTIPLYING POLYNOMIALS:

* Multiply binomials #'s 35 + 36 + 40
* MULTIPLY binomial times trinomial # 37
* MULTIPLY SQUARED BINOMIALS # 38 + 39 - remember to expand binomials

Find the product.

35. $(z + 9)(2z - 7)$
36. $(5b - 2)(8b - 7)$
37. $(q + 2)(-3q^2 + 6q - 1)$
38. $(7 + y)^2$
39. $(2k - 11)^2$
40. $(12w - 5)(12w + 5)$

35 $2z^2 - 7z + 18z - 63 =$ $\boxed{2z^2 + 11z - 63}$

36 $40b^2 - 35b - 16b + 14 =$ $\boxed{40b^2 - 51b + 14}$

37 $(Q+2)(-3Q^2+6Q-1) = -3Q^3 + 6Q^2 - Q$
$-6Q^2 + 12Q - 2 =$
$\boxed{-3Q^3 + 11Q - 2}$

Remember to expand $(7+y)^2 =$

38 $(7+y)(7+y) = 49 + 14y + y^2 =$ $\boxed{y^2 + 14y + 49}$

39 $(2k-11)(2k-11) =$
$2k^2 - 22k - 22k + 121$
$\boxed{4k^2 - 44k + 121}$

40 $(12w - 5)(12w + 5) = 144w^2 + 60w - 60w - 25 =$
$\boxed{144w^2 - 25}$

FACTORING

1. 1ST STEP ALWAYS IS TO FACTOR OUT THE GCF (See # 44)
2. COMPLETELY FACTOR (see # 45)
3. 4 TERMS "THING FACTOR BY GROUPING (see #46)
4. TO SOLVE BY FACTORING, YOU MUST FACTOR COMPLETELY, THEN SET EVERY FACTOR TO ZERO AND SOLVE EACH FACTOR.

1 72
2 36
3 24
4 18
*6 12
8 9

Factor the expression.

41. $x^2 + 6x - 72$
42. $2m^2 - 5mn - 3n^2$
43. $25d^2 + 60d + 36$
44. $-2a^2 + 50b^2$
45. $z^2(z - 6) + 4(6 - z)$
46. $y^3 + 8y^2 - 9y - 72$

Solutions

$x=6,-12$ **41** $(x+12)(x-6)$

CANNOT SOLVE **42** $(2m+n)(m-3n)$

$D=-\frac{6}{5}$ **43** $(5D+6)(5D+6)$ or $(5D+6)^2$

CANNOT SOLVE **44** $-2(A^2-25B^2) = -2(A-5B)(A+5B)$

$x=6,-2,2$ **45** $z^2(z-6)+(-1)4(z-6) = (z-6)(z^2-4) = (z-6)(z+2)(z-2)$

$x=-8, 3, -3$ **46** $y^3+8y^2-9y-72 =$

$y^2(y+8)-9(y+8) = (y+8)(y^2-9) =$

$(y+8)(y-3)(y+3)$

#47 $y = x^2 - 4x + 1$

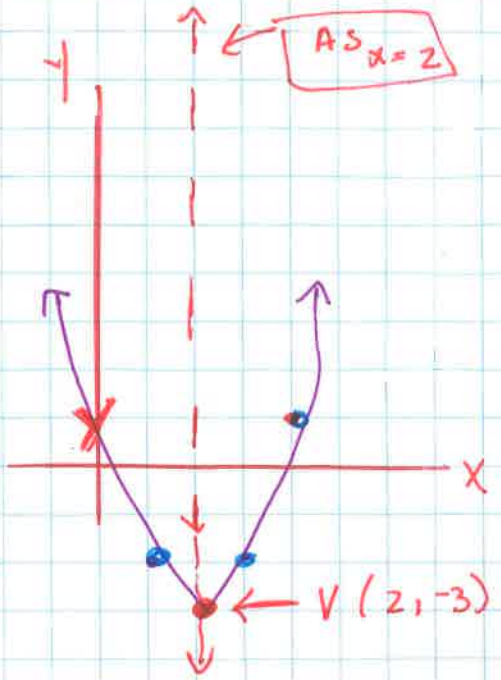
$A = 1$ OPENS UP
$B = -4$
$C = 1$ y intercept $(0, 1)$

AS: $x = \frac{-B}{2A} = \frac{4}{2(1)} = \frac{4}{2}$ $\boxed{x = 2}$

VERTEX $(2, -3)$

$y = 2^2 - 4(2) + 1 = -3$

x	0	1	2 (V)	2	4
y	1	-2	-3	-2	1



#49 $y = -x^2 - 4x + 10$

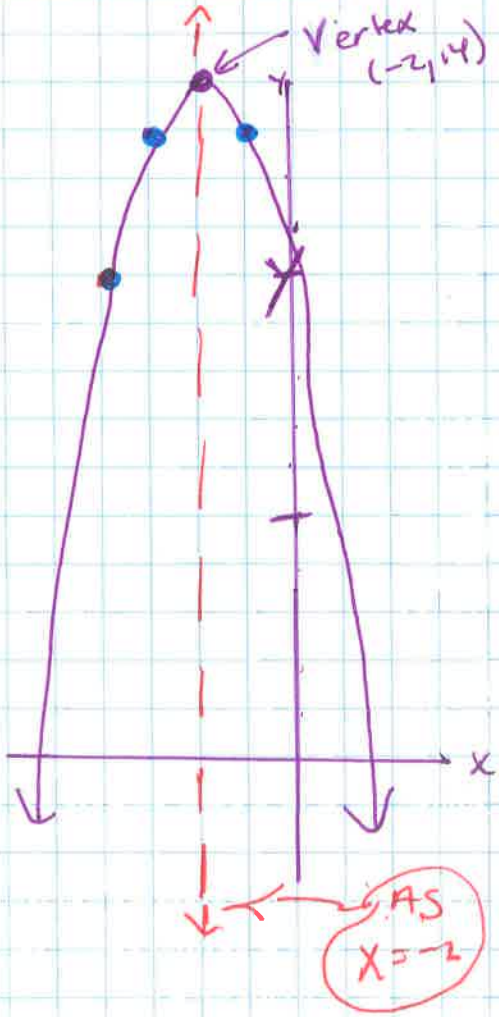
$A = -1$ opens down
$B = -4$
$C = 10$ y int $(0, 10)$

AS: $x = \frac{-B}{2A} = \frac{4}{2(-1)}$ $\boxed{x = -2}$

Vertex $(-2, 14)$

$y = -(-2)^2 - 4(-2) + 10 = 14$

x	-4	-3	-2 (V)	-1	0
y	10	13	14	13	10



SOLVING QUADRATIC EQUATIONS:

① FACTOR METHOD – ONLY # 50 COULD BE SOLVED USING THIS METHOD

② ALL CAN BE SOLVED WITH THE QUADRATIC FORMULA

QE → $AX^2+BX+C=0$ QF → $X=\frac{-B\pm\sqrt{B^2-4AC}}{2A}$

③ #'s 50 + 51 CAN BE SOLVED BY SQUARE ROOTS
- ISOLATE X^2 → THEN TAKE $\sqrt{}$ OF BOTH SIDES

SOLVE #50 by FACTORING:

$5X^2-720=0$

$5(x^2-144)=0$

$5(X-12)(X+12)=0$

$X=12,-12$

Solve the equation. Round your solutions to the nearest hundredth, if necessary.

50. $5x^2 - 720$ 51. $-x^2 + 12 = 1$ 52. $x^2 + 6x - 13 = 0$

53. $-2x^2 + 7x - 3 = 0$ 54. $4x^2 - 9x = 9$ 55. $-7x^2 + 7x + 3 = 4x - 1$

← PUT INTO $Ax^2+Bx+C=0$

OR ↳ **50** $\frac{5x^2}{5}=\frac{720}{5}$

$\sqrt{x^2}=\sqrt{144}$

$X=\pm 12$

remember 2 solutions

51 $\sqrt{x^2}=\sqrt{11}$

IF ASKED TO GIVE IN RADICAL FORM → $X=\pm\sqrt{11}$

$X\simeq\pm 3.32$

IF ASKED TO ROUND TO 2 Decimals

52 $A=1$ $B=6$ $C=-13$

$X=\frac{-6\pm\sqrt{36-4(1)(-13)}}{2(1)}$ ← SHOW Substitutions

$X=\frac{-6\pm\sqrt{88}}{2}$ ← SHOW # HERE. DO NOT ROUND! Here

$X=\frac{-6+\sqrt{88}}{2}$ $X=\frac{-6-\sqrt{88}}{2}$

$X\simeq 1.69$ $X\simeq -7.69$

53 $A=-2$ $B=7$ $C=-3$

$X=\frac{-7\pm\sqrt{49-4(-2)(-3)}}{2(-2)}$

$X=\frac{-7\pm 5}{-4}$

$X=.5, 3$

54 $4x^2-9x-9=0$

$A=4$

$B=-9$

$C=-9$

$X=\frac{9\pm\sqrt{81-4(4)(-9)}}{2(4)}$

$X=\frac{9\pm\sqrt{225}}{8}$ (15)

$X=2, -.75$

55* $-7x^2+3x+4=0$

$A=-7$ $B=3$ $C=4$

$X=\frac{-3\pm\sqrt{9-4(-7)(4)}}{2(-7)}$

$X=\frac{-3\pm\sqrt{121}}{-14}$ (11)

$X=1, -.57$

* EQ Could also be $7x^2-3x-4=0$ (You will get same solutions)