

FINAL EXAM REVIEW

Comulative Review Chapters 1-10 (pg 706)

- Clearly show your work and check your answers
- START FILLING IN YOUR 3XS 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

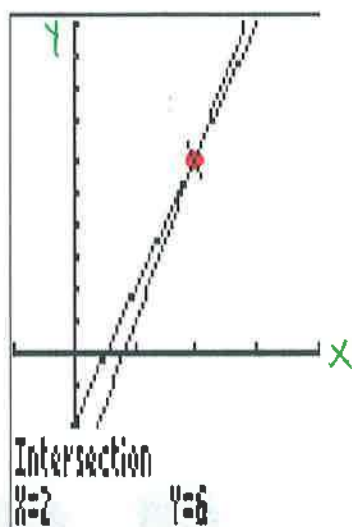
ELIMINATION METHOD

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: $6 = 5(2) - 4$
 $6 = 6 \checkmark$

C: $6 = 4(2) - 2$
 $6 = 6 \checkmark$

25. $x - 4y = -44$
 $-3x + 12y = 132$

$$\begin{array}{r} + \\ \downarrow \\ \hline 3x - 12y = -132 \\ -3x + 12y = 132 \\ \hline 0 = 0 \end{array}$$

$X = \text{INFINITE SOLUTIONS}$

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

$X = \text{NO SOLUTION}$

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.

$y = 5x - 4$

$y = 5(2) - 4$

$y = 6$

26. $\begin{cases} -4x + 7y = -33 \\ -3x + 2y = -15 \end{cases} \times 3$
 $\times 4$

$$\begin{array}{r} + \\ \downarrow \\ \hline -12x + 21y = -99 \\ 12x - 8y = 60 \\ \hline \end{array}$$

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

$y = -3$

Find x:

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

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

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

$x = 3$

Solution (3, -3)

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

C: $-3(3) + 2(-3) = -15$
 $-15 = -15 \checkmark$

Chapter 8 - EXPONENTS

Know
These
rules

$$x^2 \cdot x^3 = \boxed{x^5}$$

$$(x^2)^3 = \boxed{x^6}$$

$$x^0 = \boxed{1}$$

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

Simplify the expression.

27. $(-9r)^3$

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

* $\boxed{-729 r^3}$

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

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

* $\boxed{8 p^{19}}$

always to
write
answers
** vs *

** These are written as powers

* These are simplified

NEGATIVE $\rightarrow$ POSITIVE
EXPONENTS

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

$$x^{-3} = \frac{1}{x^3}$$

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

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

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

OR

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

Add Like terms
 put in STANDARD FORMAT
 • H $\rightarrow$ L EXPONENT
 • Constant Last

Find the sum or difference

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

$$-x^2 + 12x + 12$$

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

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

③ Then ADD

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

① Rewrite as an addition problem

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. $(z + 9)(2z - 7)$

37. $(q + 2)(-3q^2 + 6q - 1)$

39. $(2k - 11)^2$

36. $(5b - 2)(8b - 7)$

38. $(7 + y)^2$

40. $(12w - 5)(12w + 5)$

35. $2z^2 - 7z + 18z - 63 =$
 $2z^2 + 11z - 63$

36. $40b^2 - 35b - 16b + 14 =$
 $40b^2 - 51b + 14$

37. $(q + 2)(-3q^2 + 6q - 1) = -3q^3 + 6q^2 - q$
 $-6q^2 + 12q - 2 =$

$-3q^3 + 11q - 2$

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

38. $(7 + y)(7 + y) = 49 + 14y + y^2 =$
 $y^2 + 14y + 49$

39. $(2k - 11)(2k - 11) =$
 $4k^2 - 44k + 121$

40. $(12w - 5)(12w + 5) = 144w^2 + 60w - 60w - 25 =$
 $144w^2 - 25$

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.

Factor the expression.

41. $x^2 + 6x - 72$

43. $25d^2 + 60d + 36$

45. $z^2(z-6) + 4(6-z)$

12
36
4
2
18
12
9
8
6

42. $2m^2 - 5mn - 3n^2$

44. $-2a^2 + 50b^2$

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

$$B = -4$$

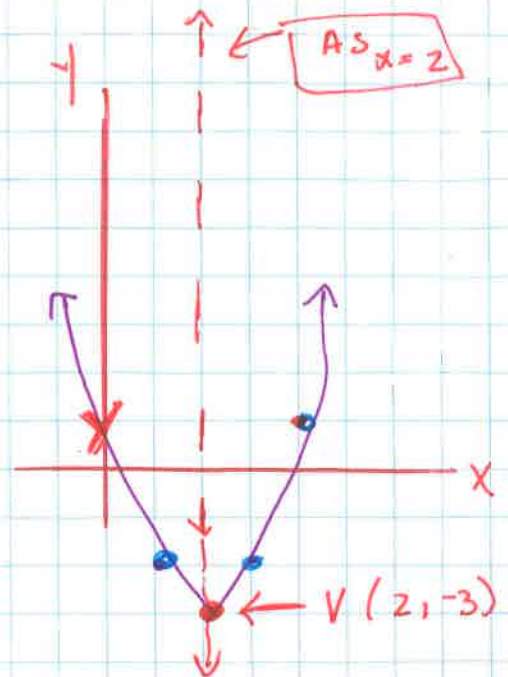
C=1 y intercept (0,1)

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

Vertex (2, -3)

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

x	0	1	2	3	4
y	1	-2	-3	-2	1



#49

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

A=-1 opens down

$$B = -4$$

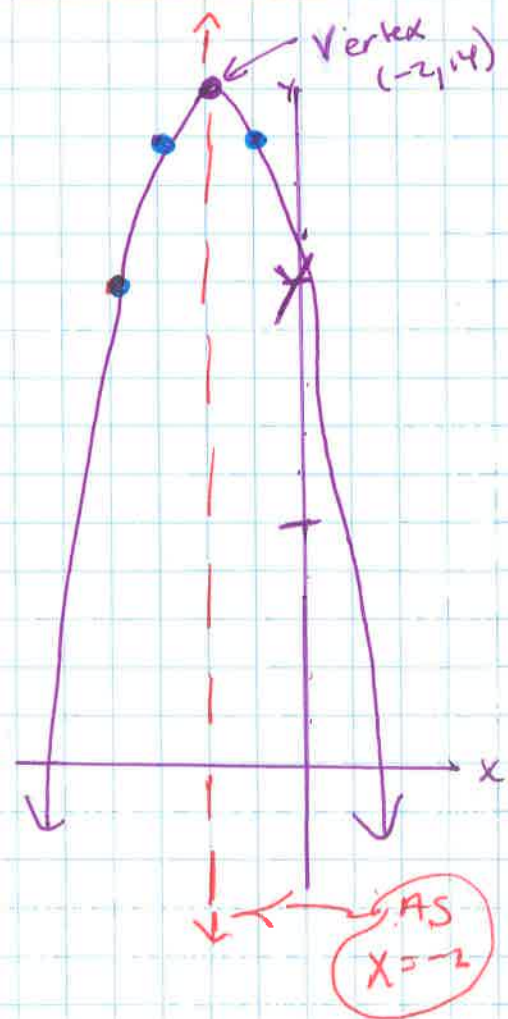
C=10 yint (0,10)

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

Vertex (-2, 14)

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

x	-4	-3	-2	-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

$$QE \rightarrow Ax^2 + Bx + C = 0 \quad QF \rightarrow x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

③ #5'S 50 + 51 CAN BE SOLVED BY SQUARE ROOTS

• ISOLATE $x^2 \rightarrow$ THEN TAKE $\sqrt{\quad}$ OF BOTH SIDES

Solve #50 by FACTORING:

$$5x^2 - 720 = 0$$

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

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

$$x = 12, -12$$

OR

[50]

$$5x^2 = 720$$

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

$$x = \pm 12$$

remember 2 solutions

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

50. $5x^2 - 720 = 0$

51. $-x^2 + 12 = 1$

52. $x^2 + 6x - 13 = 0$

53. $-2x^2 + 7x - 3 = 0$

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

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

← PUT INTO $Ax^2 + Bx + C = 0$

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

IF ASKED TO GIVE IN RADICAL FORM

$$x = \pm \sqrt{11}$$

$$x \approx \pm 3.32$$

IF ASKED TO ROUND TO 2 DECIMALS

[52] $A=1 \quad B=6 \quad C=-13$

$$x = \frac{-6 \pm \sqrt{36 - 4(1)(-13)}}{2(1)}$$

← SHOW SUBSTITUTIONS

$$x = \frac{-6 \pm \sqrt{88}}{2}$$

← SHOW # HERE. DO NOT ROUND! HERE

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

$$x = \frac{-6 - \sqrt{88}}{2}$$

$$x \approx 1.69$$

$$x \approx -7.69$$

[53] $A=-2 \quad B=7 \quad C=-3$

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

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

$$x = 0.5, 3$$

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

$A=4$

$B=-9$

$C=-9$

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

$$x = \frac{9 \pm \sqrt{225}}{8}$$

$$x = 2, -0.75$$

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

$A=-7$

$B=3$

$C=4$

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

$$x = \frac{-3 \pm \sqrt{121}}{-14}$$

$$x = 1, -0.57$$

* EQ could also be

$$7x^2 - 3x - 4 = 0$$

(You will get same solutions)