

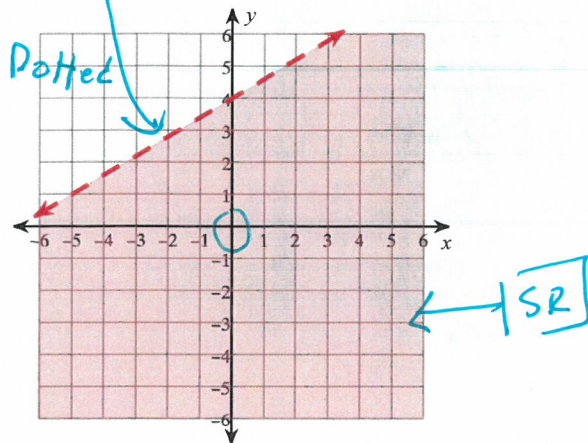
Practice Final 2023

Date _____ Period _____

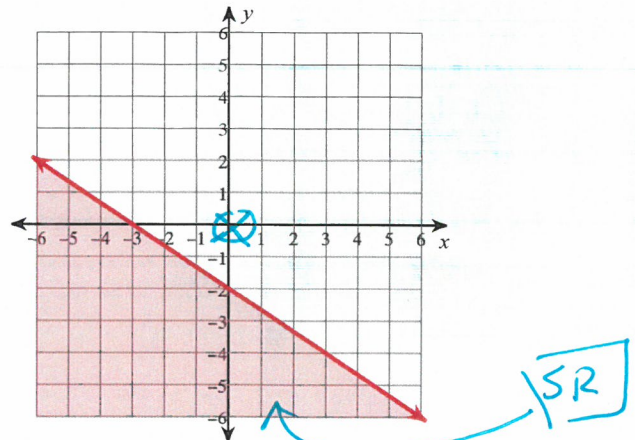
Chapter 7 Graphing Systems (esource: Ch7 Graphing Practice Test)

Sketch the graph of each linear inequality. Show a test point

1) $y < \frac{3}{5}x + 4$ $T(0,0) \rightarrow 0 < 4$ (T)

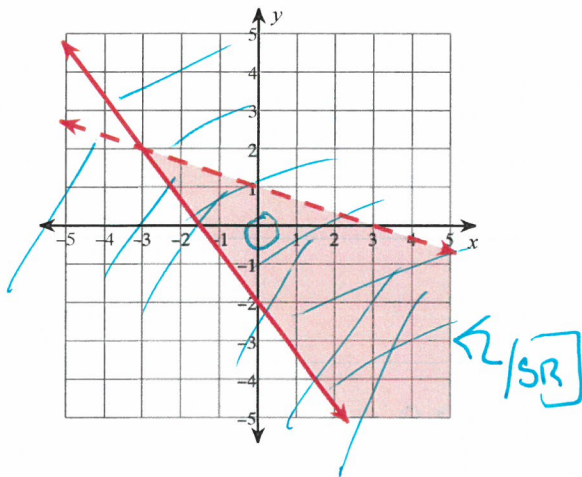


2) $y \leq -\frac{2}{3}x - 2$ $T(0,0) \rightarrow 0 \leq -2$ (F)

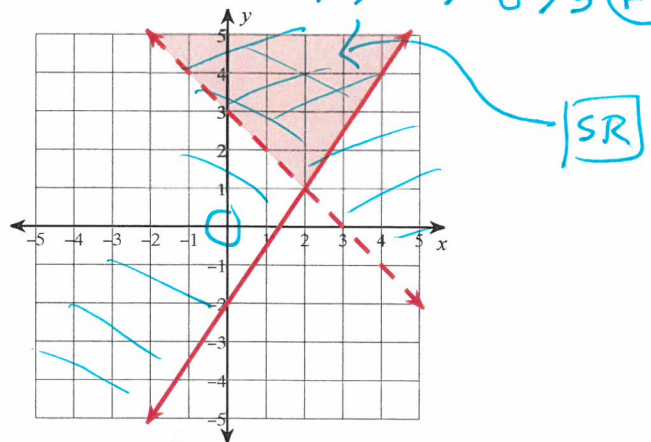


Sketch the solution to each system of inequalities. Show a test point for each equation.

3) $y \geq -\frac{4}{3}x - 2$ $T(0,0) \rightarrow 0 \geq -2$ (T)
 $y < -\frac{1}{3}x + 1$ $T(0,0) \rightarrow 0 < 1$ (T)



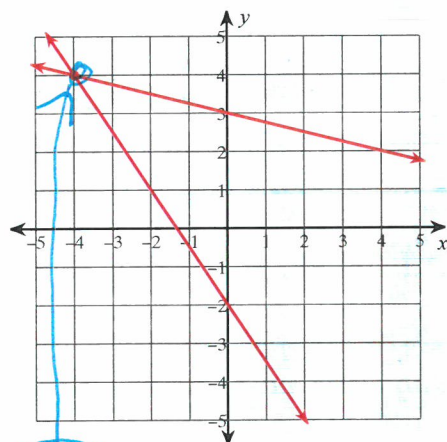
4) $y \geq \frac{3}{2}x - 2$ $T(0,0) \rightarrow 0 \geq -2$ (T)
 $y > -x + 3$ $T(0,0) \rightarrow 0 > 3$ (F)



$<, >$ $\rightarrow$ dotted line
 $\leq, \geq$ $\rightarrow$ solid line

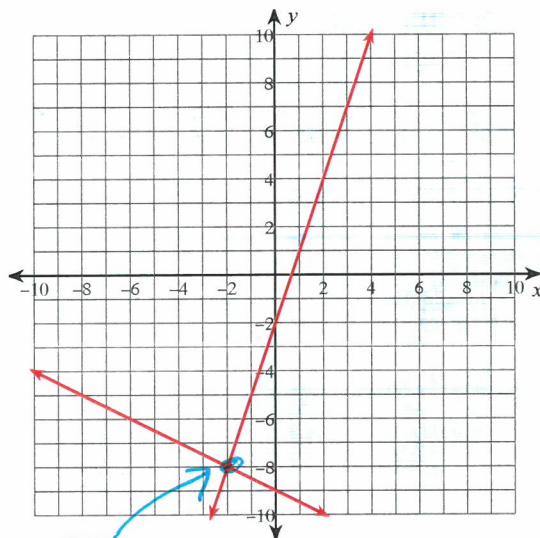
Solve each system by graphing (recommend checking)

5) $y = -\frac{3}{2}x - 2$
 $y = -\frac{1}{4}x + 3$



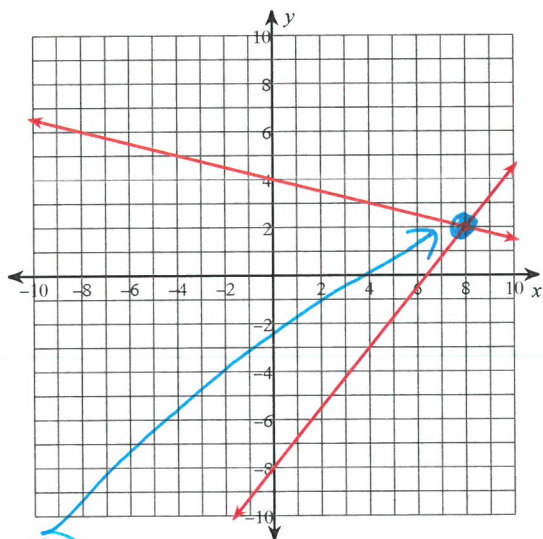
$(-4, 4)$

6) $y = 3x - 2$
 $y = -\frac{1}{2}x - 9$



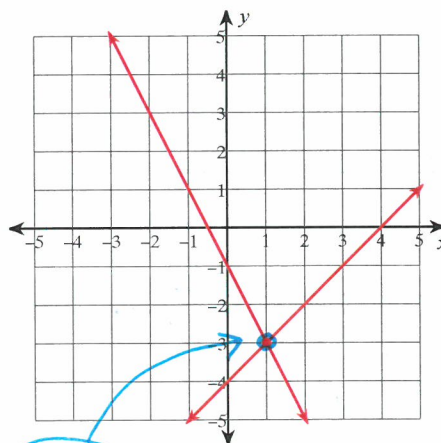
$(-2, -8)$

7) $y = \frac{5}{4}x - 8$
 $y = -\frac{1}{4}x + 4$



$(8, 2)$

8) $y = -2x - 1$
 $y = x - 4$



$(1, -3)$

Chapter 7 - Solving Systems (source Chapter 7 Test)

ALL QUESTIONS ARE 10pts. Read instructions! Recommend checking for partial credit.

Solve each system by substitution. Then check the solution algebraically

9) $y = 5x + 25$
 $12x + 3y = -33$

$(-4, 5)$

$$12x + 3(5x + 25) = -33$$

$$12x + 15x + 75 = -33$$

$$27x + 75 = -33$$

$$\underline{-75 \quad -75}$$

$$\frac{27x}{27} = \frac{-108}{27}$$

$$x = -4$$

FIND Y

$$y = 5(-4) + 25$$

$$y = 5$$

Solve each system by elimination.

10) $10x - 9y = -11$
 $-1(10x - 10y = -10)$

$(-2, -1)$

$$\begin{array}{r} \rightarrow 10x - 9y = -11 \\ \rightarrow -10x + 10y = 10 \\ \hline y = -1 \end{array}$$

FIND X

$$10x - 9(-1) = -11$$

$$10x + 9 = -11$$

$$\underline{-9 \quad -9}$$

$$\frac{10x}{10} = \frac{-20}{10}$$

$$x = -2$$

11) $9x + 7y = 7$
 $-8x - 7y = -14$
 $(-7, 10)$

$$x = -7$$

FIND Y

$$9(-7) + 7y = 7$$

$$\underline{+63 \quad +63}$$

$$\frac{7y}{7} = \frac{70}{7}$$

$$y = 10$$

Solve the system using either the substitution or elimination method.

$$12) \begin{cases} 12x - 2y = -18 \\ 2x + y = -7 \end{cases} \rightarrow \begin{array}{r} 12x - 2y = -18 \\ 4x + 2y = -14 \\ \hline 16x = -32 \\ \hline x = -2 \end{array}$$

$(-2, -3)$

FIND Y

$$2(-2) + y = -7$$

$$-4 + y = -7$$

$$y = -3$$

$$13) \begin{cases} x = 6y + 1 \\ 4x - 8y = 20 \end{cases} \rightarrow \begin{array}{r} x = 6y + 1 \\ 4x - 8y = 20 \\ \hline 4(6y + 1) - 8y = 20 \\ 24y + 4 - 8y = 20 \\ 16y + 4 = 20 \\ 16y = 16 \\ \hline y = 1 \end{array}$$

$(7, 1)$

FIND X:

$$x = 6(1) + 1$$

$$x = 7$$

$$14) \begin{cases} y = 8x - 16 \\ 2x - 2y = 18 \end{cases}$$

$(1, -8)$

$$2x - 2(8x - 16) = 18$$

$$2x - 16x + 32 = 18$$

$$-14x + 32 = 18$$

$$-14x = -14$$

$$x = 1$$

FIND Y

$$y = 8(1) - 16$$

$$y = -8$$

$$15) \begin{cases} -8x - 5y = -21 \\ 3x - 9y = -3 \end{cases} \cdot 3 \rightarrow \begin{array}{r} -24x - 15y = -63 \\ 9x - 27y = -9 \\ \hline -15x + 12y = -54 \\ \cdot 5 \rightarrow \begin{array}{r} -75x + 60y = -270 \\ 9x - 27y = -9 \\ \hline -66x + 87y = -261 \\ \cdot 2 \rightarrow \begin{array}{r} -132x + 174y = -522 \\ 18x - 54y = -18 \\ \hline -114x + 228y = -540 \\ \cdot 3 \rightarrow \begin{array}{r} -342x + 684y = -1620 \\ 114x - 228y = 540 \\ \hline -228x + 456y = -1080 \\ \cdot 3 \rightarrow \begin{array}{r} -684x + 1368y = -3240 \\ 684x - 228y = 1080 \\ \hline -1140x + 1596y = -2160 \\ \cdot 5 \rightarrow \begin{array}{r} -5700x + 7980y = -10800 \\ 1140x - 1596y = 2160 \\ \hline -4560x + 6384y = -8640 \\ \cdot 5 \rightarrow \begin{array}{r} -22800x + 31920y = -43200 \\ 4560x - 6384y = 8640 \\ \hline -18240x + 25536y = -34560 \\ \cdot 5 \rightarrow \begin{array}{r} -91200x + 127680y = -172800 \\ 18240x - 25536y = 34560 \\ \hline -73040x + 102144y = -138240 \\ \cdot 5 \rightarrow \begin{array}{r} -365200x + 510720y = -691200 \\ 73040x - 102144y = 138240 \\ \hline -292160x + 408576y = -552960 \\ \cdot 5 \rightarrow \begin{array}{r} -1460800x + 2042880y = -2764800 \\ 292160x - 408576y = 552960 \\ \hline -1168640x + 1634304y = -2211840 \\ \cdot 5 \rightarrow \begin{array}{r} -5843200x + 8171520y = -11059200 \\ 1168640x - 1634304y = 2211840 \\ \hline -4674560x + 6537216y = -9247360 \\ \cdot 5 \rightarrow \begin{array}{r} -23372800x + 32686080y = -46236800 \\ 4674560x - 6537216y = 9247360 \\ \hline -18698240x + 26148864y = -37019440 \\ \cdot 5 \rightarrow \begin{array}{r} -93491200x + 130744320y = -185097200 \\ 18698240x - 26148864y = 37019440 \\ \hline -74792960x + 104595456y = -151477760 \\ \cdot 5 \rightarrow \begin{array}{r} -373964800x + 522977280y = -757388800 \\ 74792960x - 104595456y = 151477760 \\ \hline -300171840x + 418381824y = -605911040 \\ \cdot 5 \rightarrow \begin{array}{r} -1500859200x + 2091909120y = -3029555200 \\ 300171840x - 418381824y = 605911040 \\ \hline -1200687360x + 1673527296y = -2423644160 \\ \cdot 5 \rightarrow \begin{array}{r} -6003436800x + 8367636480y = -12118220800 \\ 1200687360x - 1673527296y = 2423644160 \\ \hline -4802749440x + 6694109184y = -14541865000 \\ \cdot 5 \rightarrow \begin{array}{r} -24013747200x + 33470545920y = -72709325000 \\ 4802749440x - 6694109184y = 14541865000 \\ \hline -19210997760x + 26776436736y = -58167460000 \\ \cdot 5 \rightarrow \begin{array}{r} -96054988800x + 133882183680y = -290837300000 \\ 19210997760x - 26776436736y = 58167460000 \\ \hline -76843991040x + 107105746944y = -348999760000 \\ \cdot 5 \rightarrow \begin{array}{r} -384219955200x + 535528734720y = -1744998800000 \\ 76843991040x - 107105746944y = 348999760000 \\ \hline -307375964160x + 428422987776y = -1400999040000 \\ \cdot 5 \rightarrow \begin{array}{r} -1536879820800x + 2142114938880y = -7004995200000 \\ 307375964160x - 428422987776y = 1400999040000 \\ \hline -1229503856640x + 1713691951104y = -5603996160000 \\ \cdot 5 \rightarrow \begin{array}{r} -6147519283200x + 8568459755520y = -28019980800000 \\ 1229503856640x - 1713691951104y = 5603996160000 \\ \hline -4918015426560x + 6854767804416y = -33623976960000 \\ \cdot 5 \rightarrow \begin{array}{r} -24590077132800x + 34273839022080y = -168119884800000 \\ 4918015426560x - 6854767804416y = 33623976960000 \\ \hline -19672061706240x + 27419071217664y = -140495907840000 \\ \cdot 5 \rightarrow \begin{array}{r} -98360308531200x + 137095356088320y = -702479539200000 \\ 19672061706240x - 27419071217664y = 140495907840000 \\ \hline -78688247725040x + 109676284870656y = -842975447040000 \\ \cdot 5 \rightarrow \begin{array}{r} -393441238625200x + 548381424353280y = -4214877235200000 \\ 78688247725040x - 109676284870656y = 842975447040000 \\ \hline -314753114802680x + 438705181917920y = -5057852682240000 \\ \cdot 5 \rightarrow \begin{array}{r} -1573765574013400x + 2193525909589600y = -25289263411200000 \\ 314753114802680x - 438705181917920y = 5057852682240000 \\ \hline -1259008459210720x + 1754820727671680y = -20241410728960000 \\ \cdot 5 \rightarrow \begin{array}{r} -6295042296053600x + 8774103638358400y = -101207053644800000 \\ 1259008459210720x - 1754820727671680y = 20241410728960000 \\ \hline -5035538066842880x + 7019283274522560y = -80965642915840000 \\ \cdot 5 \rightarrow \begin{array}{r} -25177690334214400x + 35096416372612800y = -404828214579200000 \\ 5035538066842880x - 7019283274522560y = 80965642915840000 \\ \hline -20142121300793600x + 28077175098091200y = -323862571663360000 \\ \cdot 5 \rightarrow \begin{array}{r} -100710606503968000x + 140385875490456000y = -1619312858316800000 \\ 20142121300793600x - 28077175098091200y = 323862571663360000 \\ \hline -80568545853571200x + 112308297941404800y = -1295450286653440000 \\ \cdot 5 \rightarrow \begin{array}{r} -402842729267856000x + 561541489707024000y = -6477251433267200000 \\ 80568545853571200x - 112308297941404800y = 1295450286653440000 \\ \hline -322558456341270400x + 449233141735622400y = -5181801146613760000 \\ \cdot 5 \rightarrow \begin{array}{r} -1612792281706352000x + 2246165708678112000y = -25909005733068800000 \\ 322558456341270400x - 449233141735622400y = 5181801146613760000 \\ \hline -1290213053535712000x + 1801928566842297600y = -21527204586435200000 \\ \cdot 5 \rightarrow \begin{array}{r} -6451065267678560000x + 9009642834211488000y = -107636022932176000000 \\ 1290213053535712000x - 1801928566842297600y = 21527204586435200000 \\ \hline -5155958741912704000x + 7197714567369190400y = -86108818345740800000 \\ \cdot 5 \rightarrow \begin{array}{r} -25779793709563520000x + 35988572836845952000y = -430544091728704000000 \\ 5155958741912704000x - 7197714567369190400y = 86108818345740800000 \\ \hline -20621814338607168000x + 28390715553161760000y = -347435273382963200000 \\ \cdot 5 \rightarrow \begin{array}{r} -103109071693035840000x + 141953577765808800000y = -1737176366914816000000 \\ 20621814338607168000x - 28390715553161760000y = 347435273382963200000 \\ \hline -82498164523732256000x + 117758222189227040000y = -1460343093531872000000 \\ \cdot 5 \rightarrow \begin{array}{r} -412490822618661280000x + 588791110946135200000y = -7301715467659360000000 \\ 82498164523732256000x - 117758222189227040000y = 1460343093531872000000 \\ \hline -331241740356835136000x + 470912008751521760000y = -5841373974127424000000 \\ \cdot 5 \rightarrow \begin{array}{r} -1656208701784175680000x + 2354560043757608800000y = -29206869870637120000000 \\ 331241740356835136000x - 470912008751521760000y = 5841373974127424000000 \\ \hline -1320587831605758080000x + 1883604039382047040000y = -23625495896509760000000 \\ \cdot 5 \rightarrow \begin{array}{r} -6602939158028790400000x + 9418020196910235200000y = -118127479482548800000000 \\ 1320587831605758080000x - 1883604039382047040000y = 23625495896509760000000 \\ \hline -5282645242225910400000x + 7526216157219212800000y = -94464957593999040000000 \\ \cdot 5 \rightarrow \begin{array}{r} -26413226211129552000000x + 37631080786096064000000y = -472324787969995200000000 \\ 5282645242225910400000x - 7526216157219212800000y = 94464957593999040000000 \\ \hline -21131903589016601600000x + 30064864628876851200000y = -377859830375992000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -105659517945083008000000x + 150324323144384256000000y = -1889299151879960000000000 \\ 21131903589016601600000x - 30064864628876851200000y = 377859830375992000000000 \\ \hline -84593566150564704000000x + 120261888529947404800000y = -1511459321503968000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -422967830752823520000000x + 601309442649737024000000y = -7557296607519840000000000 \\ 84593566150564704000000x - 120261888529947404800000y = 1511459321503968000000000 \\ \hline -338674267677541120000000x + 481047554089789624000000y = -6045837285915872000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -1693371338387705600000000x + 2405237770448948120000000y = -30229186429579360000000000 \\ 338674267677541120000000x - 481047554089789624000000y = 6045837285915872000000000 \\ \hline -1354634204549935040000000x + 1924189916359558496000000y = -24183349143663520000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -6773171022749675200000000x + 9620949581797792480000000y = -120916745718317600000000000 \\ 1354634204549935040000000x - 1924189916359558496000000y = 24183349143663520000000000 \\ \hline -54188369184997401600000000x + 7716359665199193920000000y = -96730596574654080000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -270941845924987008000000000x + 38581798325995969600000000y = -483652982873270400000000000 \\ 54188369184997401600000000x - 7716359665199193920000000y = 96730596574654080000000000 \\ \hline -216747661332488806400000000x + 308635986507967750400000000y = -3869223942986163200000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -1083738306662444032000000000x + 1543179932539838752000000000y = -19346119714930816000000000000 \\ 216747661332488806400000000x - 308635986507967750400000000y = 3869223942986163200000000000 \\ \hline -8663644753299392256000000000x + 1234543945031871392000000000y = -15476895887944652800000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -43318223766496961280000000000x + 6172719725159356960000000000y = -77384479439723264000000000000 \\ 8663644753299392256000000000x - 1234543945031871392000000000y = 15476895887944652800000000000 \\ \hline -34684381412997569920000000000x + 4938175790079673792000000000y = -61913159755692928000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -173421907064987849600000000000x + 24690878950398368960000000000y = -309565798778464640000000000000 \\ 34684381412997569920000000000x - 4938175790079673792000000000y = 61913159755692928000000000000 \\ \hline -1387295256259939296000000000000x + 197454395251991844800000000000y = -2478263194313830400000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -6936476281299696480000000000000x + 987271976259959224000000000000y = -12391315971569152000000000000000 \\ 1387295256259939296000000000000x - 197454395251991844800000000000y = 2478263194313830400000000000000 \\ \hline -5549180925039758080000000000000x + 790835987503979612800000000000y = -9892631977054643200000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -27745904625198790400000000000000x + 3954179937519898064000000000000y = -49463159885273216000000000000000 \\ 5549180925039758080000000000000x - 790835987503979612800000000000y = 9892631977054643200000000000000 \\ \hline -222367137001590304000000000000000x + 3163359950015918067200000000000y = -47570527908218560000000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -1111835685007951520000000000000000x + 158167997500795903360000000000000y = -237852639541092800000000000000000 \\ 222367137001590304000000000000000x - 3163359950015918067200000000000y = 47570527908218560000000000000000 \\ \hline -8974725480063612160000000000000000x + 126534398000796722688000000000000y = -1902821116328742400000000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -44873627400318060800000000000000000x + 6326719900039836134400000000000000y = -9514105581643712000000000000000000 \\ 8974725480063612160000000000000000x - 126534398000796722688000000000000y = 1902821116328742400000000000000000 \\ \hline -363913019202544512000000000000000000x + 506035995001591806720000000000000y = -7607052790821856000000000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -1819565096012722560000000000000000000x + 25301799750079590336000000000000000y = -38035263954109280000000000000000000 \\ 363913019202544512000000000000000000x - 506035995001591806720000000000000y = 7607052790821856000000000000000000 \\ \hline -14556520768101700800000000000000000000x + 126508798750398361344000000000000000y = -1921410558164371200000000000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -72782603840508504000000000000000000000x + 632543993751989806400000000000000000y = -9607052790821856000000000000000000000 \\ 14556520768101700800000000000000000000x - 126508798750398361344000000000000000y = 1921410558164371200000000000000000000 \\ \hline -591320830724068032000000000000000000000x + 5060359950015918067200000000000000000y = -76070527908218560000000000000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -2956604153620340160000000000000000000000x + 253017997500795903360000000000000000000y = -380352639541092800000000000000000000000 \\ 591320830724068032000000000000000000000x - 5060359950015918067200000000000000000y = 76070527908218560000000000000000000000 \\ \hline -23652833229762721280000000000000000000000x + 1265087987503983613440000000000000000000y = -1921410558164371200000000000000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -118264166148813606400000000000000000000000x + 6325439937519898064000000000000000000000y = -9607052790821856000000000000000000000000 \\ 23652833229762721280000000000000000000000x - 1265087987503983613440000000000000000000y = 1921410558164371200000000000000000000000 \\ \hline -946113329190508851200000000000000000000000x + 5060359950015918067200000000000000000000y = -7607052790821856000000000000000000000000 \\ \cdot 5 \rightarrow \begin{array}{r} -4730566645952544256000000000000000000000000x + 25301799750079590336000000000000000000000y = -38035263954109280000000000000000000000000 \\ 946113329190508851200000000000000000000000x - 5060359950015918067200000000000000000000y = 7607052790821856000000000000000000000000 \\ \hline -37844532727620352000000000000000000000000000x + 1265087987503983613440000000000000000000000y = -1921410558$$

WPs: Solve the system using either the substitution or elimination method.

- 17) Paul and Asanji each improved their yards by planting rose bushes and geraniums. They bought their supplies from the same store. Paul spent \$106 on 6 rose bushes and 7 geraniums. Asanji spent \$126 on 6 rose bushes and 9 geraniums. Find the cost of one rose bush and the cost of one geranium.

****Key Information:**

Paul spent \$106, 6 roses, 7 geraniums
Asanji spent \$126, 6 " , 9 "

Define variables:

X = Cost of a rose (\$)
Y = Cost of a geranium (\$)

Define system:

EQ1: Paul: $6x + 7y = 106$
EQ2: Asanji: $6x + 9y = 126$

Solve the system:

Find X:
$$\begin{array}{r} 6x + 7y = 106 \\ -2y = -20 \\ \hline 6x = 36 \\ \hline x = 6 \end{array}$$

$$\begin{array}{r} 6x + 7y = 106 \\ -6x - 9y = -126 \\ \hline -2y = -20 \\ \hline y = 10 \end{array}$$

The plant costs were
Answer (in words):
rose bush \$6, geranium \$10

- 18) Natalie's school is selling tickets to the annual talent show. On the first day of ticket sales the school sold 18 senior citizen tickets and 14 student tickets for a total of \$412. The school took in \$222 on the second day by selling 15 senior citizen tickets and 3 student tickets. What is the price each of one senior citizen ticket and one student ticket?

****Key Information:**

1ST DAY: 18 senior, 14 students, sales \$412
2ND DAY: 15 " , 3 " " \$222

Define variables:

X = Cost of Senior ticket (\$)
Y = Cost of student ticket (\$)

Define system:

EQ1: DAY 1: $18x + 14y = 412$
EQ2: DAY 2: $15x + 3y = 222$

Solve the system:

Find X:
$$\begin{array}{r} 18x + 14y = 412 \\ -18x - 14y = -196 \\ \hline 18x = 216 \\ \hline x = 12 \end{array}$$

$$\begin{array}{r} 18x + 14y = 412 \\ -18x - 14y = -196 \\ \hline 156y = 2184 \\ \hline y = 14 \end{array}$$

Answer (in words):
senior citizen ticket \$12, student ticket \$14.

Chapter 8 - Exponents "source: 8.1 - 8.3 Working with Exponents (2020):

8.1) Simplify. Your answer should contain only positive exponents.

Order variables ABC
order

$$19) -3m \cdot -2m^2$$

$$6m^3$$

$$20) -x^4y^3 \cdot -x^4y^3$$

$$x^8y^6$$

$$21) -3x^3y^4 \cdot -2x^4y^3$$

$$6x^7y^7$$

$$22) 4x^2y^2 \cdot -y^3 \cdot -x^2y^2$$

$$4x^4y^7$$

$$23) 2x^2y^4 \cdot 4y$$

$$8x^2y^5$$

$$24) -mn^2 \cdot -3n^3$$

$$3mn^5$$

$$25) 3u^3v^2 \cdot 3u$$

$$9u^4v^2$$

$$26) -4x^4 \cdot -2y^2$$

$$8x^4y^2$$

$$27) -4b^4 \cdot a^3b^3 \cdot -3a^3b^3$$

$$12b^{10}a^6 \rightarrow (12a^6b^{10})$$

$$28) x^3y^3 \cdot -4x^2y^4 \cdot 3x^2y^2$$

$$-12x^7y^9$$

$$29) 4x \cdot 4x^2y^3$$

$$16x^3y^3$$

$$30) 2m^3n^3 \cdot 3nm^4$$

$$6m^7n^4$$

8.2) Simplify. Leave answers with improper fractions using only positive exponents.

$$31) \frac{4k^3}{-2k}$$

$$-2k^2$$

$$32) \frac{4x^{-1}}{-4x^{-2}} \rightarrow -1x^{-1-(-2)} = \boxed{-x}$$

$$33) \frac{b^{-1}}{-4b} - \frac{1}{4b^2}$$

$$34) -\frac{x^3}{4x^3} - \frac{1}{4} \rightarrow -\frac{1}{4}x^{3-3} = -\frac{1}{4}x^0 = \boxed{-\frac{1}{4}}$$

$$35) -\frac{4x^4}{x^{-4}}$$

$$-4x^8$$

$$36) \frac{-3v^4}{-2v} \frac{3v^3}{2}$$

$$37) \frac{n^2}{3n^3} \frac{1}{3n}$$

$$38) \frac{2v^4}{v^{-3}}$$

$$2v^7$$

$$39) \frac{-4x^2}{-3x^4} \frac{4}{3x^2}$$

$$40) \frac{2x^{-4}}{x} \frac{2}{x^5} \rightarrow 2x^{-4-1} = \frac{2x^{-5}}{1} = \boxed{\frac{2}{x^5}}$$

$$41) \frac{2x^4}{x^4}$$

$$2$$

$$42) \frac{-2n^4}{-3n^{-2}} \frac{2n^6}{3}$$

Chapter 8 - Exponents - More practice problems

Simplify. Leave answers with improper fractions using only positive exponents.

$$43) (4x^2y^0)^3$$

$$64x^6$$

$$44) (-2xy^3)^0$$

$$1$$

$$45) (-3mn^4)^3 = (-3)^3 m^{1 \cdot 3} n^{4 \cdot 3}$$

$$-27m^3n^{12}$$

$$46) (-2xy)^4$$

$$16x^4y^4$$

$$47) \left(\frac{3x^{-2}}{2x^{-1}} \right)^4$$

$$\frac{81}{16x^4}$$

skip

NOT ON FINAL

$$48) \left(\frac{-4x^{-3}y^2}{-2y^4} \right)^2$$

$$\frac{4}{x^6y^4}$$

skip

$$49) \frac{12x^{-3}y^2}{15x^3}$$

$$-\frac{4y^2}{5x^6}$$

$$-\frac{4x^{-3-3}y^2}{5} = -\frac{4x^{-6}y^2}{5}$$

$$50) \frac{-4xy^3}{-x^0}$$

$$4xy^3$$

$$51) \frac{2y^{-1}}{3x^{-4}y^{-4}}$$

$$\frac{2x^4y^3}{3}$$

$$52) \frac{-8xy^2}{-16x^4y^3}$$

$$\frac{1}{2x^3y}$$

Chapter 9 - Polynomials and Factoring

(esource: 9.1 to 9.7 KUTA Review - with some modifications to match Final)

Name each polynomial by degree and number of terms.

53) $-9x - 7x^3 - 8x^2$

cubic trinomial

55) $5k^3 - 1$

cubic binomial

57) $n + 5n^3 - 1$

cubic trinomial

54) $-7k^3 - 2$

cubic binomial

56) 9

constant monomial

58) $-3x - 9x^3 + 7x^2$

cubic trinomial

Simplify each sum.

Add Like Terms

59) $(3x^2 - x^3 - 1) + (1 - 3x^2 - 2x^3)$

$-3x^3$

60) $(3x^4 - x^2 - 3x^3) + (-4x^4 - x^3 - 6)$

$-x^4 - 4x^3 - x^2 - 6$

order variables
H → L exponents

Simplify each difference.

Tip: Write as addition problem first

61) $(-6x^2 - x^3 + 6x) - (8x^3 - 6 + 6x^2)$

$-9x^3 - 12x^2 + 6x + 6$

62) $(6x^4 - x - x^2) - (-x - 2x^4 + 8x^2)$

$8x^4 - 9x^2$

$6x^4 - x - x^2 + x + 2x^4 - 8x^2 =$
 $8x^4 - 9x^2$

Find each product.

63) $-2x(3x^2 - 2x - 8)$

$-6x^3 + 4x^2 + 16x$

* 64) $(7x + 8)(3x - 3) = 21x^2 - 21x + 24x - 24$
 $21x^2 + 3x - 24$

65) $(3x + 6)(3x - 6)$

$9x^2 - 36$

66) $(2x - 6)^2 \rightarrow \text{expand } (2x - 6)(2x - 6)$
 $4x^2 - 24x + 36$

67) $(3x - 3)(7x^2 - 3x - 8)$

$21x^3 - 30x^2 - 15x + 24$

Chapter 9 - Polynomials and Factoring (cont)

Factor

68) $x^2 - 15x + 54$

$(x - 6)(x - 9)$

$+c \rightarrow$ same signs
(+, +)
(-, -)

When $A=1$
Ask Yourself
- • - = 50
- + - = -15

69) $x^2 - 5x - 36$

$(x - 9)(x + 4)$

$-c \rightarrow$ opposite signs

70) $x^2 - 8x + 15$

$(x - 5)(x - 3)$

71) $n^2 - 5n - 50$

$(n + 5)(n - 10)$

mentally multiply to check

$n^2 - 10n + 5n - 50 =$
 $n^2 - 5n - 50$ ✓

72) $25x^2 - 16$

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

SPECIAL CASE
PSQ - PSQ

73) $4n^2 - 12n + 9$

$(2n - 3)(2n - 3)$

SPECIAL CASE
1ST AND LAST TERMS
ARE PERFECT
SQUARES

Factor completely

STEP 1 - ALWAYS FACTOR GCF

74) $5n^2 - 5n - 60 = 5(n^2 - n - 12)$

$5(n - 4)(n + 3)$

75) $4x^2 + 12x - 112 = 4(x^2 + 3x - 28)$

$4(x - 4)(x + 7)$

76) $6x^2 - 18x$

$6x(x - 3)$

77) $5x^2 + 5x - 360$

$5(x - 8)(x + 9)$

$5(x^2 + x - 72)$

78) $-n^2 + n + 20$

$-(n - 5)(n + 4)$

WHEN A/LEA COEF IS
Negative
factor out
-1

$-(n^2 - n - 20)$

$-(n - 5)(n + 4)$

79) $-5n^2 - 35n + 150 = -5(n^2 + 7n - 30)$

$-5(n + 10)(n - 3)$

Chapter 9 - Factoring (esource: selected problems from Chapter 9 KUTA Review)

SOLVE each equation by factoring. Remeber do calculator checks in the original equation!

NOTE: SOME OF THESE EQ's NEED TO BE PUT IN STANDARD FORM $\rightarrow AX^2 + BX + C = 0$

80) $x^2 + 7x = -10$

$\{-2, -5\}$

$x^2 + 7x + 10 = 0$

Factor

$(x+5)(x+2) = 0$

Set to 0

$x+5=0$

$x+2=0$

Solve

$x = -5$

$x = -2$

81) $2x^2 + 26x = -80$

$\{-8, -5\}$

$2x^2 + 26x + 80 = 0$

GCF

$2(x^2 + 13x + 40) = 0$

Factor + Solve

$2(x+8)(x+5) = 0$

$2 = 0$

$x+8=0$
 $x = -8$

$x+5=0$
 $x = -5$

82) $0 = 20 - 5n^2$ Rewrite

$\{-2, 2\}$

$5n^2 - 20 = 0$

GCF

$5(n^2 - 4) = 0$

$5(n-2)(n+2) = 0$

$n=2$

$n=-2$

$C: 0=0 \checkmark$

$C: 0=0 \checkmark$

84) $b^2 + 10b + 25 = 0$

$\{-5\}$

$(b+5)(b+5) = 0$

$b+5=0$

$b = -5$

83) $3x^2 = -3x$

$\{-1, 0\}$

$3x^2 + 3x = 0$

GCF

$3x(x+1) = 0$

$3x=0$

$x=0$

$C: 0=0 \checkmark$

$x+1=0$

$x=-1$

$C: 3=3 \checkmark$

85) $5b^2 - 15b = 20$

$\{4, -1\}$

$5b^2 - 15b - 20 = 0$

GCF

$5(b^2 - 3b - 4) = 0$

$5(b-4)(b+1) = 0$

$b=4$

$b=-1$

esource: Practice Test 10.1-10.3 - Graph Quadratics (selected problems)

For each quadratic function, clearly answer the following questions:

- Identify the coefficients of the quadratic function. Label "A, B, C"
- Determine the direction of the parabola and explain. Label "SHAPE:"
- Identify the ordered pair for the y-intercept and explain. Label "Y-INT:"

86) $f(x) = -x^2 + 10$ $\longrightarrow y = -x^2 + 0x + 10$

$a=-1, b=0, c=10$ $\leftarrow$ (a)

Opens DOWN b/c $A=-1$ $\leftarrow$ (b)

Y-int $(0,10)$ b/c $C=10$ $\leftarrow$ (c)

Graph the quadratic function in standard form and identify the y-intercept, axis of symmetry, and vertex.

(a) Clearly graph at least 5 points and provide the supporting table of values in the space provided below. Mark the vertex on the table.

(b) Give the ordered pair for the y-intercept: $(0,3)$. Mark it on the graph with a "Y".

(c) Calculate the axis of symmetry below. What is the appropriate equation for A.S.. Mark it "AS" on the graph.

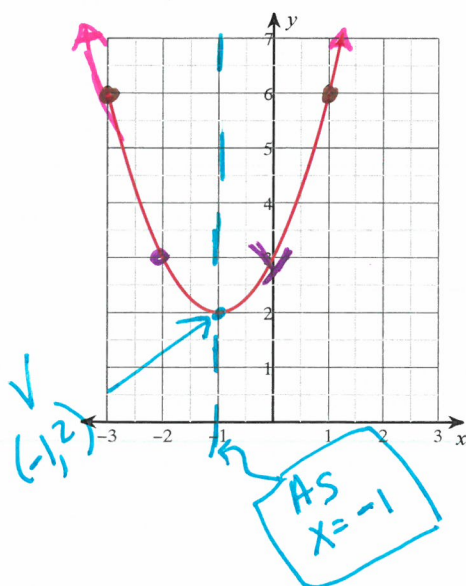
(d) Give the ordered pair for the vertex $(-1,2)$. Mark it "V" on the graph.

87) $f(x) = x^2 + 2x + 3$ $\longrightarrow y = x^2 + 2x + 3$ $\uparrow A=1$ $B=2$ $C=3$

AS $\boxed{x = \frac{-B}{2A}}$

$x = \frac{-2}{2(1)} = -1$

x	-3	-2	-1	0	1
y	6	3	2	3	6



Graph the quadratic function in standard form and identify the y-intercept, axis of symmetry, and vertex.

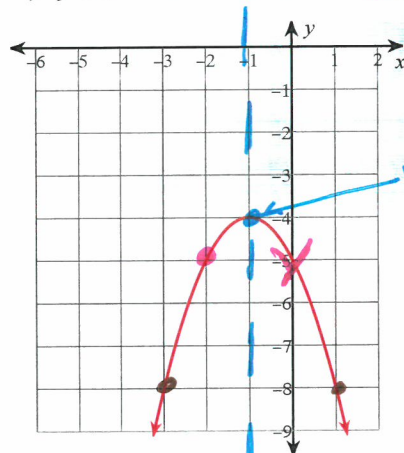
(a) Clearly graph at least 5 points and provide the supporting table of values in the space provided below. Mark the vertex on the table.

(b) Give the ordered pair for the y-intercept: $(0, -5)$. Mark it on the graph with a "Y".

(c) Calculate the axis of symmetry below. What is the appropriate equation for A.S.. Mark it "AS" on the graph.

(d) Give the ordered pair for the vertex $(-1, -4)$. Mark it "V" on the graph.

88) $f(x) = -x^2 - 2x - 5$



AS
 $x = -1$

$A = -1$

$B = -2$

$C = -5$

AS: $x = \frac{2}{2(-1)} = -1$

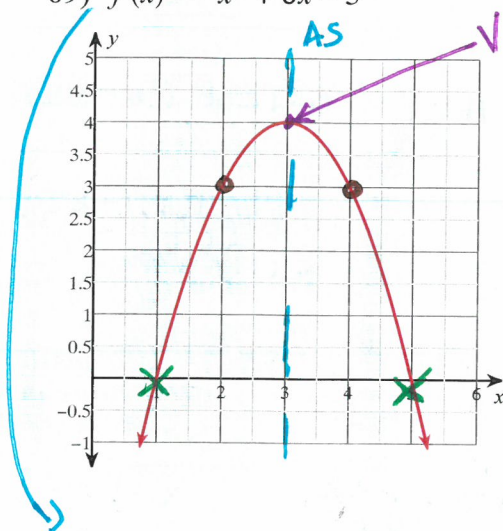
X	-3	-2	-1	0	1
Y	-8	-5	-4	-5	-8

SOLVE the quadratic function by graphing.

SOLVE BY GRAPHING

(a) Clearly graph at least 5 points and provide the supporting table of values in the space provided below. Mark the vertex on the table; (b) If possible, mark intercepts on graph with "x" and "y". (c) Mark the "AS" on the graph. (d) Circle the solutions are label $x = \underline{\hspace{1cm}}$.

89) $f(x) = -x^2 + 6x - 5$



$A = -1 \quad B = 6 \quad C = 5$

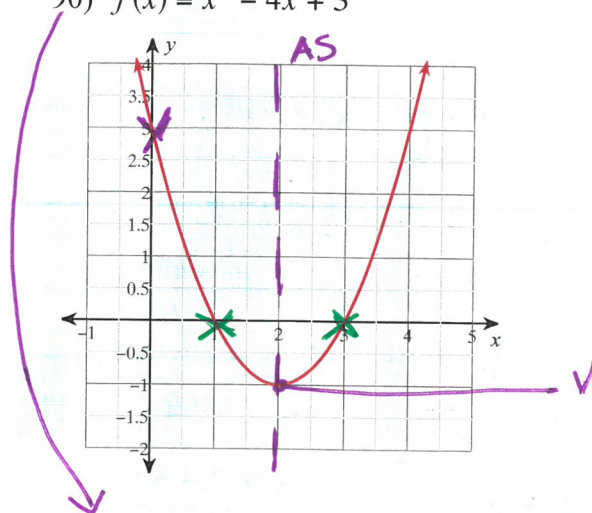
AS $x = \frac{-b}{2(-1)}$

$x = 3$

x	1	2	3	4	5
y	0	3	4	3	0

Solutions
 $x = 1, 5$

90) $f(x) = x^2 - 4x + 3$



$A = 1 \quad B = -4 \quad C = 3$

AS $x = \frac{4}{2(1)}$

$x = 2$

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

Solutions
 $x = 1, 3$

10.6 - Solve Quadratic with the Quad. Formula (see 10.6 Practice A handout)

Solve each equation with the quadratic formula. (1) State A,B,C; (2) clearly show work; (3) Show checks

91) $2x^2 - 2x - 144 = 0$

$\{9, -8\}$

$A=2 \quad B=-2 \quad C=-144$

$$X = \frac{2 \pm \sqrt{4 - 4(2)(-144)}}{2(2)}$$

$$X = \frac{2 \pm \sqrt{1156}}{4}$$

$$X = \frac{2+34}{4}$$

$$\boxed{X=9}$$

$$X = \frac{2-34}{4}$$

$$\boxed{X=-8}$$

93) $-3x^2 - 9x + 84 = 0$

$\{-7, 4\}$

$A=-3 \quad B=-9 \quad C=84$

$$X = \frac{9 \pm \sqrt{81 - 4(-3)(84)}}{2(-3)}$$

$$X = \frac{9 \pm \sqrt{1089}}{-6}$$

$$X = \frac{9+33}{-6}$$

$$\boxed{X=-7}$$

$$X = \frac{9-33}{-6}$$

$$\boxed{X=4}$$

92) $x^2 - 12x - 85 = 0$

$\{17, -5\}$

$A=1 \quad B=12 \quad C=-85$

$$X = \frac{12 \pm \sqrt{144 - 4(1)(-85)}}{2(1)}$$

$$X = \frac{12 \pm \sqrt{484}}{2}$$

$$X = \frac{12+22}{2}$$

$$\boxed{X=17}$$

$$X = \frac{12-22}{2}$$

$$\boxed{X=-5}$$

94) $2x^2 - 8x + 8 = 0$

$\{2\}$

$A=2 \quad B=-8 \quad C=8$

$$X = \frac{8 \pm \sqrt{64 - 4(2)(8)}}{2(2)}$$

$$X = \frac{8 \pm \sqrt{0}}{4}$$

$$\boxed{X=2}$$