

> TODAY'S AGENDA:

- Continue working on Khan Academy
- Mission: Engage NY Module 4
 - > **Linear Systems of Equations Capstone**

- Today's Objective:
 - > Students will be able to graph a line, given the equation of the line in Slope-Intercept Form

- Today's Standards:
 - > 8.EE.C.8, 8.EE.C.8b, HSA.REI.C.6, HSA.SSE.B.3

Solutions to System of Equations

- What is a *System of Equations*?
 - › A System of Equations is a group of two or more equations.
- What is the Solution to a System of Equations?
 - › The solution is the point(s) (as coordinates in (x,y) form) that make the equations true.

How many solutions does the system of equations have?

- If Same Slope:
 - > and y -intercept is same, then infinite solutions.
 - > and different y -intercepts, then no solutions.
- If Different Slopes, then one solution.

$$6x - 3y = 5$$

$$y - 2x = 8$$

How many solutions does the system have?

Choose 1 answer:

(A) Exactly one solution ←

(B) No solutions

(C) Infinitely many solutions

If your answer was *Exactly one solution*, what is this solution?

If your answer was *Infinitely many solutions* or *No solutions*, leave the boxes blank.

$x =$

$y =$

$$\begin{array}{r} \cancel{6x} - \cancel{3y} = 5 \\ 3\cancel{y} - \cancel{6x} = 24 \end{array}$$

$$0 = 29$$



$$3(y - 2x = 8)$$

$$\begin{array}{r} 5x - 3y = 5 \\ -6x \qquad -6x \end{array}$$

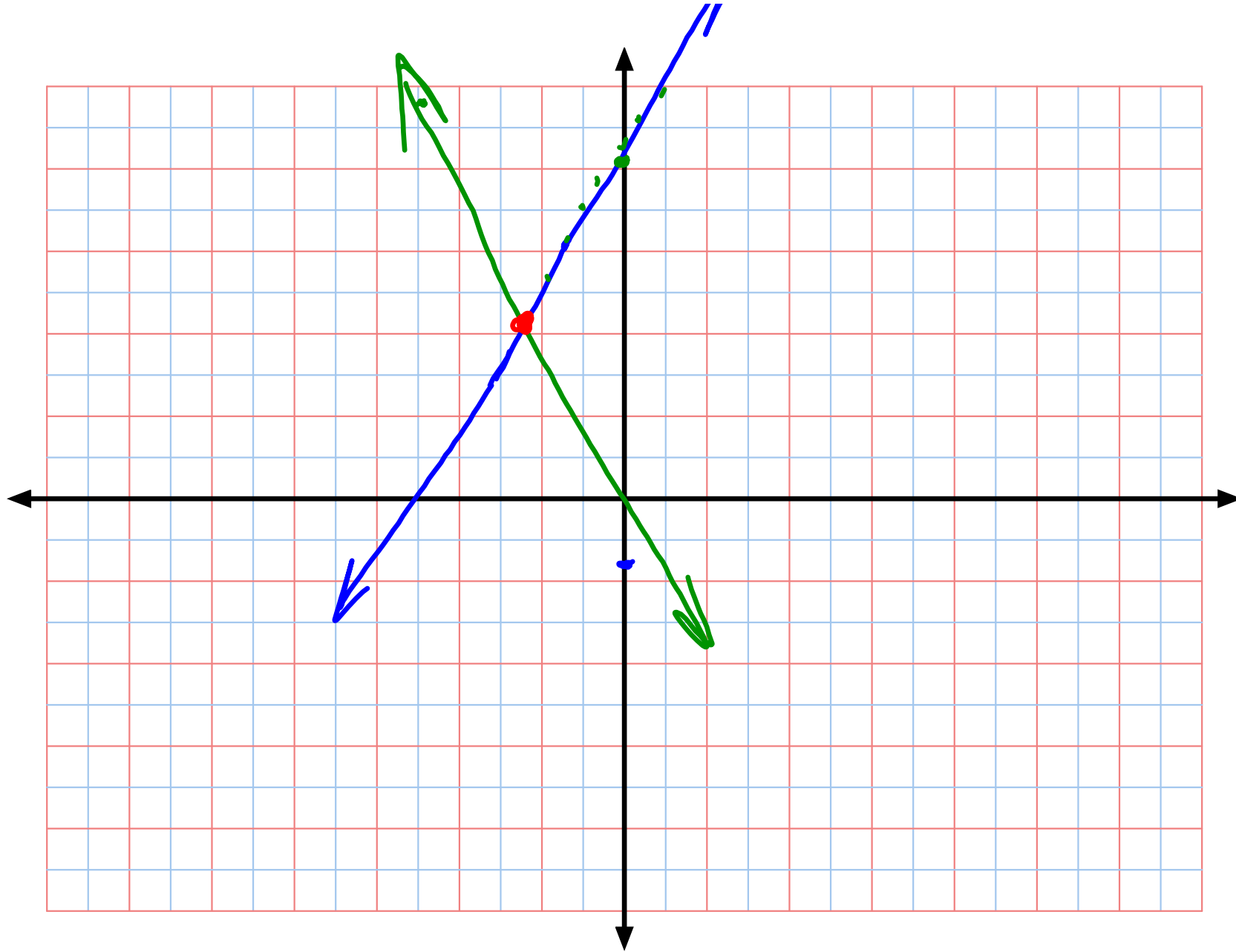
$$\begin{array}{r} -3y = -6x + 5 \\ \hline -3 \qquad -3 \end{array}$$

$$y = 2x + \frac{5}{3}$$

$$y = 2x + 8$$

$$\begin{array}{r} y - 2x = 8 \\ -2x + y = 8 \\ \hline +2x \qquad +2x \end{array}$$

Same slope
diff y-int
no solut.



$$6x - 3y = 5$$

$$y - 2x = 8$$

How many solutions does the system have?

Choose 1 answer:

(A) Exactly one solution

(B) No solutions

(C) Infinitely many solutions

If your answer was *Exactly one solution*, what is this solution?

If your answer was *Infinitely many solutions* or *No solutions*, leave the boxes blank.

$$x = \boxed{}$$

$$y = \boxed{}$$

$$\begin{array}{r}
 6x - 3y = 5 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 12x - 6y = 10 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 36x - 18y = 30 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 72x - 36y = 60 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 216x - 108y = 180 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 432x - 216y = 360 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 1296x - 648y = 1080 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 2592x - 1296y = 2160 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 7776x - 3888y = 6480 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 15552x - 7776y = 12960 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 46656x - 23328y = 38880 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 93312x - 46656y = 77760 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 279936x - 139968y = 233280 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 559872x - 279936y = 466560 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 1679616x - 839808y = 1399680 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 3359232x - 1679616y = 2799360 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 10077696x - 5038848y = 8398080 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 20155392x - 10077696y = 16796160 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 60466176x - 30233088y = 50388480 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 120932352x - 60466176y = 100776960 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 362797056x - 181398528y = 302330880 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 725594112x - 362797056y = 604661760 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 2176782336x - 1088391168y = 1813985280 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 4353564672x - 2176782336y = 3627970560 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 13060694016x - 6530347008y = 10883911680 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 26121388032x - 13060694016y = 21767823360 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 78364164096x - 39182082048y = 65303470080 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 156728328192x - 78364164096y = 130606940160 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 470184984576x - 235092492288y = 391820820480 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 940369969152x - 470184984576y = 783641640960 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 2821109907456x - 1410554953728y = 2350924922880 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 5642219814912x - 2821109907456y = 4701849845760 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 16926659444736x - 8463329722368y = 14105549537280 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 33853318889472x - 16926659444736y = 28211099074560 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 101559956668416x - 50779978334208y = 84633297223680 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 203119913336832x - 101559956668416y = 169266594447360 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 609359740010496x - 304679870005248y = 507799783342080 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 1218719480020992x - 609359740010496y = 1015599566684160 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 3656158440061984x - 1828079220031488y = 3046798700052480 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 7312316880123968x - 3656158440061984y = 6093597400104960 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 21936950640371904x - 10968475320185952y = 18280792200314880 \\
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 43873901280743808x - 21936950640371904y = 36561584400619840 \\
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 \hline
 131621703842231424x - 65810851921115712y = 109684753201859520 \\
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 \hline
 263243407684462848x - 131621703842231424y = 219369506403719040 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 789730223053388544x - 394865111526694272y = 658108519211157120 \\
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 \hline
 1579460446106777088x - 789730223053388544y = 1316217038422314240 \\
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 4738381338320331264x - 2369190669160165632y = 3948651115266942720 \\
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 9476762676640662528x - 4738381338320331264y = 7897302230533885440 \\
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 \hline
 28430288029921987616x - 14215144014960993792y = 23691906691601656320 \\
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 56860576059843975232x - 28430288029921987616y = 47383813383203312640 \\
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 170581728179531925696x - 85290864089765962848y = 142151440149609937920 \\
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 341163456359063851392x - 170581728179531925696y = 284302880299219876160 \\
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 1023490369077191554176x - 511745184538595777088y = 852908640897659628480 \\
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 2046980738154383108352x - 1023490369077191554176y = 1705817281795319256960 \\
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 6140942214463149325056x - 3070471107231574662944y = 5117451845385957770880 \\
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 12281884428926298650112x - 6140942214463149325056y = 10234903690771915541760 \\
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 36845653286778895950336x - 18422826643389447975168y = 30704711072315746629440 \\
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 73691306573557791900672x - 36845653286778895950336y = 61409422144631493250560 \\
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 221073919720673375702016x - 110686959850335485951168y = 184228266433894479751680 \\
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 442147839441346751404032x - 221073919720673375702016y = 368456532867788959503360 \\
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 1326443518324040254212096x - 663221759162020127106048y = 1106869598503354859511680 \\
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 2652887036648080508424192x - 1326443518324040254212096y = 2210739197206733757020160 \\
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 7958661110044241525272576x - 3985330554972120762636288y = 6632217591620201271060480 \\
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 15917322220088483050545152x - 7958661110044241525272576y = 13264435183240402542120960 \\
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 47751966660176966101635456x - 23875983330132724575817728y = 39853305549721207626362880 \\
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 95503933320353932203270912x - 47751966660176966101635456y = 79586611100442415252725760 \\
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 286511799961061796609812736x - 143255899980530898308106816y = 238759833301327245758177280 \\
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 573023599922123593219625472x - 286511799961061796609812736y = 477519666601769661016354560 \\
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 \hline
 1719070799766370779658876416x - 860535399883185389829438176y = 1432558999805308983081068160 \\
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 3438141599532741559317752832x - 1719070799766370779658876416y = 2865117999610617966098127360 \\
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 10314424798598224677953258496x - 5157212399299112318976379296y = 8605353998831853898294381760 \\
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 20628849597196449355906516992x - 10314424798598224677953258496y = 17190707997663707796588764160 \\
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 61886548791589348067719550976x - 30943274395794674133869775488y = 51572123992991123189763792960 \\
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 123773097583178696135439101952x - 61886548791589348067719550976y = 103144247985982246779532584960 \\
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 371319292749536088406317705904x - 185659646374768044203158651968y = 309432743957946741338697754880 \\
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 742638585499072176812635411808x - 371319292749536088406317705904y = 618865487915893480677195509760 \\
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 2227915756497216530437906235424x - 1114977878248608265211946517712y = 1856596463747680442031586519680 \\
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 4455831512994433060875812470848x - 2227915756497216530437906235424y = 3713192927495360884063177059040 \\
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 13367494538983300182627437412544x - 6683747259491649591313718206336y = 1114977878248608265211946519680 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 26734989077966600365254874825088x - 13367494538983300182627437412544y = 22279157564972165304379062354240 \\
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 \hline
 80204967233899801095764624475264x - 40102483616949900547882387237632y = 66837472594916495913137182063360 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 160409934467799602191529248950528x - 80204967233899801095764624475264y = 133674945389833001826274374125440 \\
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 481229803403398806574587746851584x - 240614891701699403287293873825792y = 401024836169499005478823872376320 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 962459606806797613149175493703168x - 481229803403398806574587746851584y = 802049672338998010957646244752640 \\
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 2887378820420392839447526481109504x - 1443689408410196410173763738554752y = 2406148917016994032872938738257920 \\
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 5774757640840785678895052962219008x - 2887378820420392839447526481109504y = 4812298034033988065745877468515840 \\
 \quad \quad \quad \cdot 3 \\
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 17324272922522357036685158886657024x - 8661936461260778518342639443317536y = 1443689408410196410173763738257920 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 34648545845044714073370317773314048x - 17324272922522357036685158886657024y = 28873788204203928394475264811095040 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 103945637535134142220110953319942144x - 5197281876756707110805547665996512y = 86619364612607785183426394433175360 \\
 \quad \quad \quad \cdot 2 \\
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 207891275070268284440221906639884288x - 103945637535134142220110953319942144y = 173242729225223570366851588866570240 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 623673825210804853320665719919652864x - 311836912605402426660334859959826432y = 51972818767567071108055476659965120 \\
 \quad \quad \quad \cdot 2 \\
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 1247347650421609706641331439839305728x - 623673825210804853320665719919652864y = 1039456375351341422201109533199421440 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 3742042951264829413282662879678611456x - 1871021475632414559961997159758957376y = 3118369126054024266603348599598264320 \\
 \quad \quad \quad \cdot 2 \\
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 7484085902529658826565325759357222912x - 3742042951264829413282662879678611456y = 6236738252108048533206657199196528640 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 22452257707588976479695977278071668736x - 11214128853794488239847988599554757376y = 18710214756324145599619971597589573760 \\
 \quad \quad \quad \cdot 2 \\
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 44904515415177952959391954556143337472x - 22452257707588976479695977278071668736y = 37420429512648294132826628796786114560 \\
 \quad \quad \quad \cdot 3 \\
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 134713546245533858878175863668430012416x - 67356773122766929439089961835759553728y = 112141288537944882398479885995547573760 \\
 \quad \quad \quad \cdot 2 \\
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 269427092491067717756351727336860024832x - 134713546245533858878175863668430012416y = 224522577075889764796959772780716687360 \\
 \quad \quad \quad \cdot 3 \\
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 808281277473203153269055182010580074496x - 404140638736601576634527590805340037248y = 673567731227669294390899618357595537280 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 1616562554946406306538110364021160148992x - 808281277473203153269055182010580074496y = 1347135462455338588781758636684300124160 \\
 \quad \quad \quad \cdot 3 \\
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 4849687664839218919614331092063480446976x - 2424843832419609474807165906053540433488y = 4041406387366015766345275908053400372480 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 9699375329678437839228662184126960893952x - 4849687664839218919614331092063480446976y = 8082812774732031532690551820105800744960 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 29098125989035313517685986552380882681856x - 14549063004517656758842993856370441334880y = 24248438324196094748071659060535404334880 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 58196251978070627035371973104761765363712x - 29098125989035313517685986552380882681856y = 48496876648392189196143310920634804469760 \\
 \quad \quad \quad \cdot 3 \\
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 174588755934211881106115939314285296085136x - 8729437796710594055305197085734841334880y = 14549063004517656758842993856370441334880 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 349177511868423762212231878628570592170272x - 174588755934211881106115939314285296085136y = 290981259890353135176859865523808826818560 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 104753253560527128663669563588571177651392x - 5237662578026356433383597085734841334880y = 87294377967105940553051970857348413348800 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 209506507121054257327339127177142355302784x - 104753253560527128663669563588571177651392y = 1745887559342118811061159393142852960851360 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 628519521363162771981017381531427065908352x - 3142597606815813859909087085734841334880y = 52376625780263564333835970857348413348800 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 1257039042726325543962034763062854131816704x - 628519521363162771981017381531427065908352y = 1047532535605271286636695635885711776513920 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 3771117128178976631886104289188562395450048x - 18855585640894881159430511485734841334880y = 31425976068158138599090870857348413348800 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 754223425635795326377220857837712479090016x - 3771117128178976631886104289188562395450048y = 6285195213631627719810173815314270659083520 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 2262670276907385979131662573513137437270048x - 1131335138453692989565831285734841334880y = 188555856408948811594305114857348413348800 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 4525340553814771958263325147026274874540096x - 2262670276907385979131662573513137437270048y = 37711171281789766318861042891885623954500480 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 13576021661444315874789975441078824623620288x - 680801083072215793739498785734841334880y = 11313351384536929895658312857348413348800 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 27152043322888631749579950882157649247240576x - 13576021661444315874789975441078824623620288y = 22626702769073859791316625735131374372700480 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 814561299686658952487398765464729477417216x - 407280650043329476243699263234841334880y = 6808010830722157937394987857348413348800 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 1629122599373317904974797530929458954834432x - 814561299686658952487398765464729477417216y = 135760216614443158747899754410788246236202880 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 4887367798119953714924392592788376864503296x - 2454483899059976857462197385464729477417216y = 4072806500433294762436992632348413348800 \\
 \quad \quad \quad \cdot 2 \\
 \hline
 9774735596239907429848785185576753729006592x - 4887367798119953714924392592788376864503296y = 8145612996866589524873987654647294774172160 \\
 \quad \quad \quad \cdot 3 \\
 \hline
 29324206788719814859746355556730261187019776x - 146621033943598611447731777$$

$$y = mx + b$$

$$y = 2x + 3$$

$$y = 2x + 3$$

Same slope

Same y-int

∞ solutions

same line

