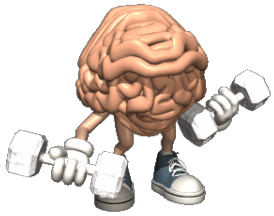
Warm Up



Solve the follwoing systems of equations using Graphing

$3x + 4y = -4$ (−3x, −3x) ⇒

$\frac{4y}{4} = \frac{-3x}{4} - \frac{4}{4}$

$y = -\frac{3}{4}x - 1$

slope $-\frac{3}{4}$ rise run

y intercept plot first

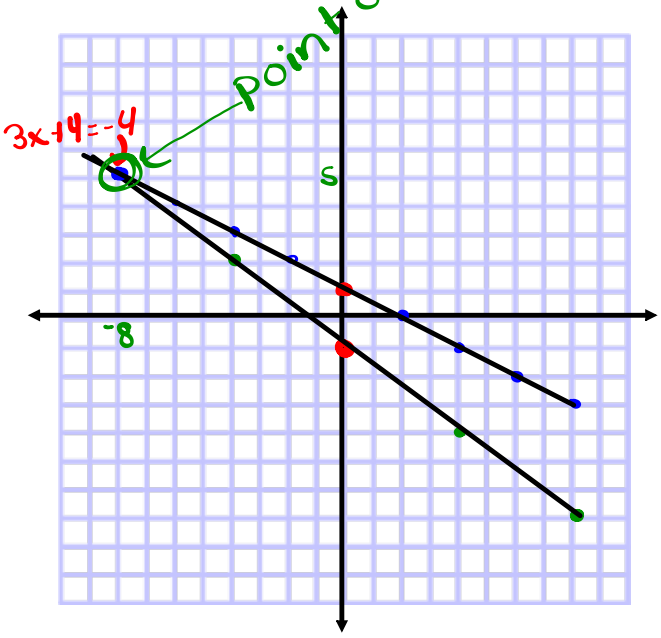
$x + 2y = 2$ (−x, −x) ⇒

$\frac{2y}{2} = \frac{-x}{2} + \frac{2}{2}$

$y = -\frac{1}{2}x + 1$

slope $-\frac{1}{2}$ rise run

y intercept

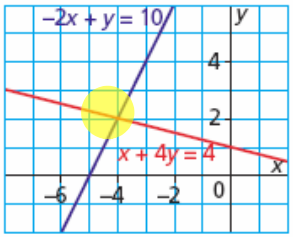


point of intersection (x, y)

(−8, 5)

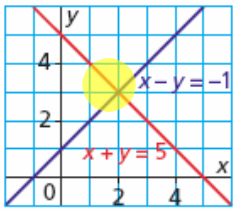
3. Determine the solution of each linear system.

a)



x= -4 , y= 2

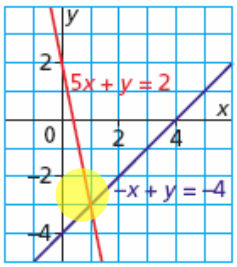
b)



x= 2 , y= 3

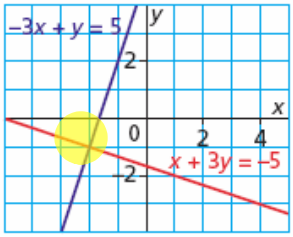
3. a) $x = -4, y = 2$
b) $x = 2, y = 3$
c) $x = 1, y = -3$
d) $x = -2, y = -1$

c)



x= 1 , y= -3

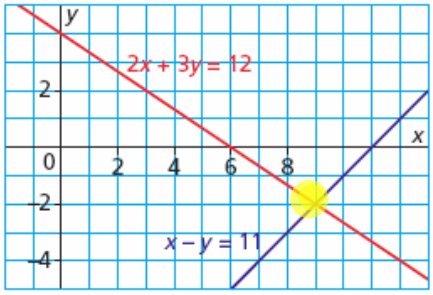
d)



x= -2 , y= -1

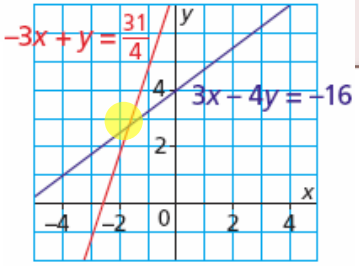
4. For each linear system, use the graphs to determine the solution. Explain how you know whether the solution is exact or approximate.

a)



x=9 , y= -2
This is exact

b)



x= -1 $\frac{3}{4}$, y= 2 $\frac{3}{4}$

This is approximate

5. a) Solve each linear system.

i) $x + y = 7$ ①

$3x + 4y = 24$ ②

(1) **x + y =7**

y = -x + 7

m= -1

y intercept = (0,7)

x intercept = (7,0)

(2) **3x + 4y = 24**

4y = -3x + 24

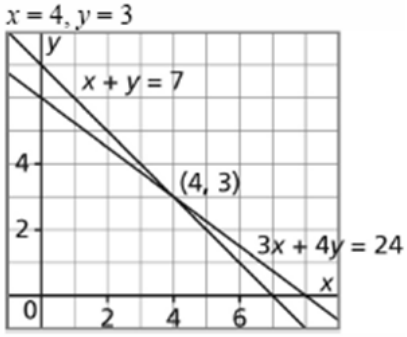
$$y = -\frac{3}{4}x + 6$$

m= -3/4

y intercept = (0,6)

x intercept = (8,0)

a) **i)** $x = 4, y = 3$

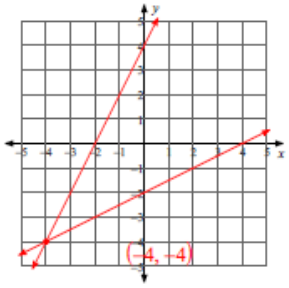


Worksheet Solutions

Solve each system by graphing.

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

$m = \frac{+2}{+1}$ or $\frac{-2}{-1}$

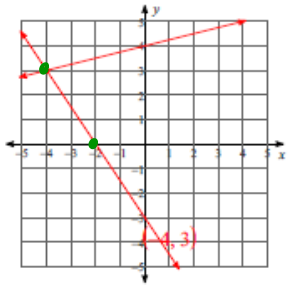


(−4, −4)

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

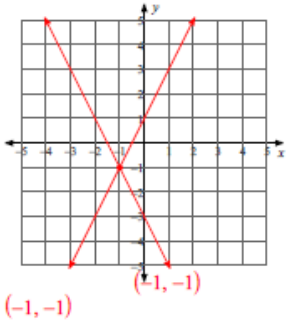
$b = -3$ $m = \frac{-3}{2}$ or $\frac{3}{-2}$ $\frac{\text{rise}}{\text{run}}$

$b = 4$ $m = \frac{+1}{+4}$ or $\frac{-1}{-4}$



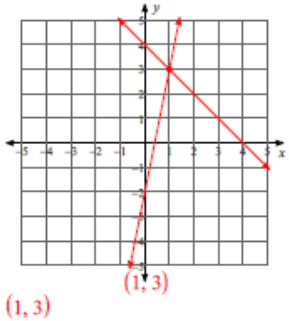
(−4, 3)

3) $y = -2x - 3$
$y = 2x + 1$



(−1, −1)

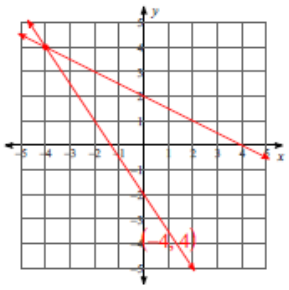
4) $y = -x + 4$
$y = 5x - 2$



(1, 3)

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

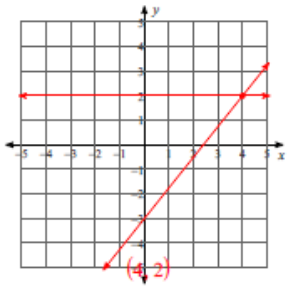
$y = -\frac{1}{2}x + 2$



(–4, 4)

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

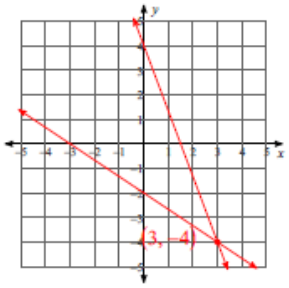
$y = 2$



(4, 2)

7) $y = -\frac{2}{3}x - 2$

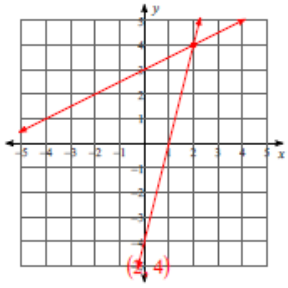
$y = -\frac{8}{3}x + 4$



(3, –4)

8) $y = \frac{1}{2}x + 3$

$y = 4x - 4$



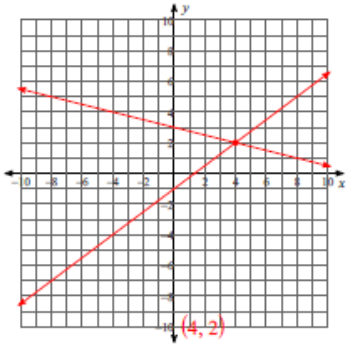
(2, 4)

$\frac{1}{3}y = 3 \cdot 1 - \frac{1}{12}x$ $y = \frac{1}{4}x - 3$

$y = 3 - \frac{3}{12}x$

9) $0 = 1 - \frac{1}{12}x - \frac{1}{3}y$
$-4y - 4 + 3x = 0$

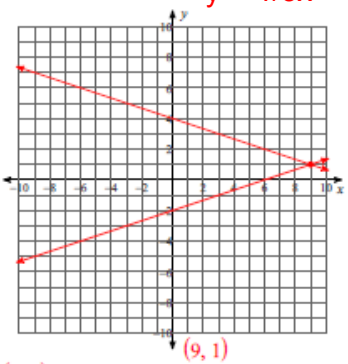
y= -1/4x +3
y= 3/4x -1



(4, 2)

10) $0 = 3y - x + 6$
$0 = -3y - x + 12$

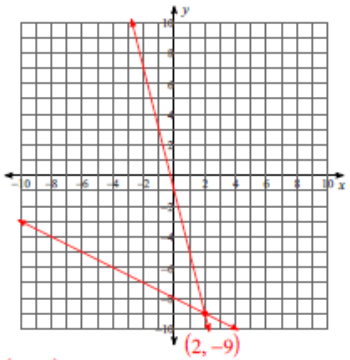
y= 1/3x - 2
y= -1/3x + 4



(9, 1)

11) $-y = 4x + 1$
$0 = -2y - 16 - x$

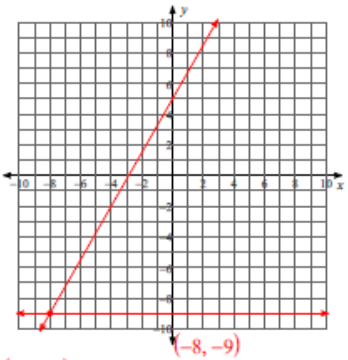
y= -4x-1
y= -1/2x - 8



(2, –9)

12) $-4y = -7x - 20$
$-y - 9 = 0$

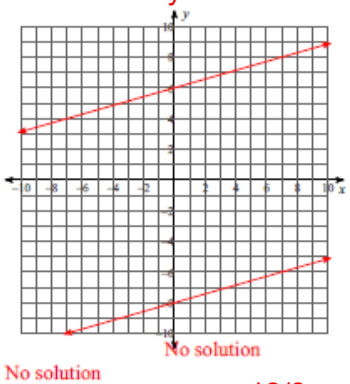
y= 7/4x + 5
y= -9



(–8, –9)

13) $2x - 7y = -42$
$2x - 7y = 56$

y= 2/7 x - 6
y= 2/7 x + 6

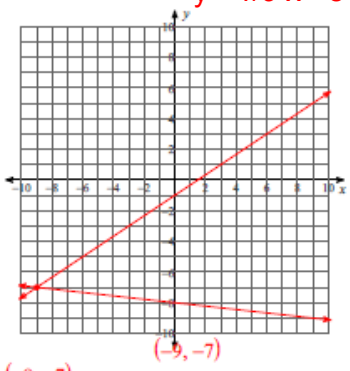


No solution

No solution

14) $2x - 3y = 3$
$x + 9y = -72$

y= 2/3 x - 1
y=-1/9 x - 8

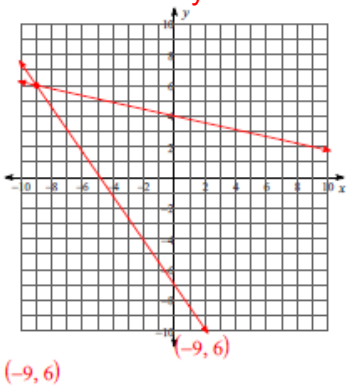


(–9, –7)

(–9, –7)

15) $13x + 9y = -63$
$2x + 9y = 36$

y= -13/9 x - 7
y= -2/9 x + 4

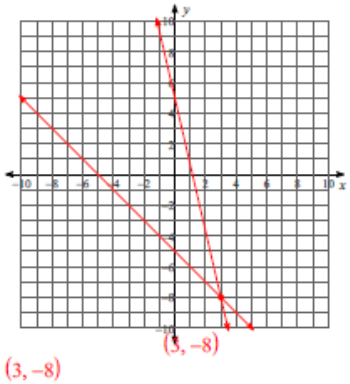


(–9, 6)

(–9, 6)

16) $x + y = -5$
$13x + 3y = 15$

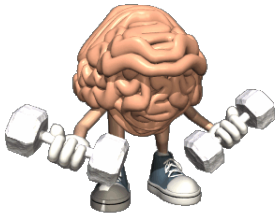
y= - x - 5
y= -13/3 x - 5



(3, –8)

(3, –8)

Warm Up



Solve the follwoing systems of equations using substitution

① $3x + 4y = -4$

② $x + 2y = 2$ (Rearrange ③ to get x alone)

③ $x = -2y + 2$

↓ Sub ③ into ①

$3(x) + 4y = -4$

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

$-6y + 6 + 4y = -4$

Collect like terms

$-2y + 6 = -4$

Solve for y

$-2y + 6 - 6 = -4 - 6$

$\frac{-2y}{-2} = \frac{-10}{-2}$

$y = 5$

↓ Sub into ③

③ $x = -2y + 2$

$-2(5) + 2$

$-10 + 2$

$x = -8$

Point of intersection

x, y

(-8, 5)

FROM LAST DAY

Steps when solving systems of equations using substitution

① $-8x + y = 0 \Rightarrow$ ③ $y = 8x$

② $x + 2y + 17 = 0$

Step 1: Isolate one of the variables with the coefficient 1 (Rearranged ① → ③)

③ $y = 8x$

Step 2: Substitute into the other equation.

③ $y = 8x$

Sub ③ into ②

② $x + 2y + 17 = 0$

$x + 2(8x) + 17 = 0$

$x + 16x + 17 = 0$

$17x + 17 = 0$

$-17 \quad -17$

$\frac{17x}{17} = \frac{-17}{17}$

$x = -1$

Step 3: Solve for the variable Using step 1's equation

Sub $x = -1$ into ③ $y = 8x$

$y = 8(x)$

$= 8(-1)$

$y = -8$

Point of intersection (x, y) $(-1, -8)$

Method 2: Substitution

I like this one better

7.4 Using a Substitution Strategy to Solve a System of Linear Equations

Solving Systems of Equations

There are a number of different ways in which to solve systems of equations. The second method we are going to look at is called *substitution.*

When we refer to solving a system of equations, we want to **solve for a numerical value** **for one variable**.

Rules for Substitution as a method for solving a system of equations.

- **There must be the same number of equations as variables.**

  - If there are two variables, there must be two equations; three variables, three equations, etc.

- **One of the equations can easily be substituted into the other equation to solve for one variable.**

You try with Substitution

Solve the follwoing systems of equations using substitution

① $y - 3x = 5$ ⇒ ③ $y = 3x + 5$

② $y + x = 3$

Sub ③ into ②

② $(y) + x = 3$

$3x + 5 + x = 3$

$4x + 5 - 5 = 3 - 5$

$\frac{4x}{4} = \frac{-2}{4}$

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

Sub ③

③ $y = 3x + 5$

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

$= -\frac{3}{2} + \frac{5}{1}$

$= -\frac{3}{2} + \frac{10}{2}$

$y = \frac{7}{2}$

Point of intersection $(\overset{x}{-\frac{1}{2}}, \overset{y}{\frac{7}{2}})$

Solve the follwoing systems of equations using substitution

① $\frac{1}{2}x + y = \frac{5}{2}$ $\cdot 2 \Rightarrow$ ③ $x + 2y = 5$

② $3 \cdot \frac{1}{3}x - \frac{1}{3}y = \frac{-1}{3}$ ④ $x - y = -1$

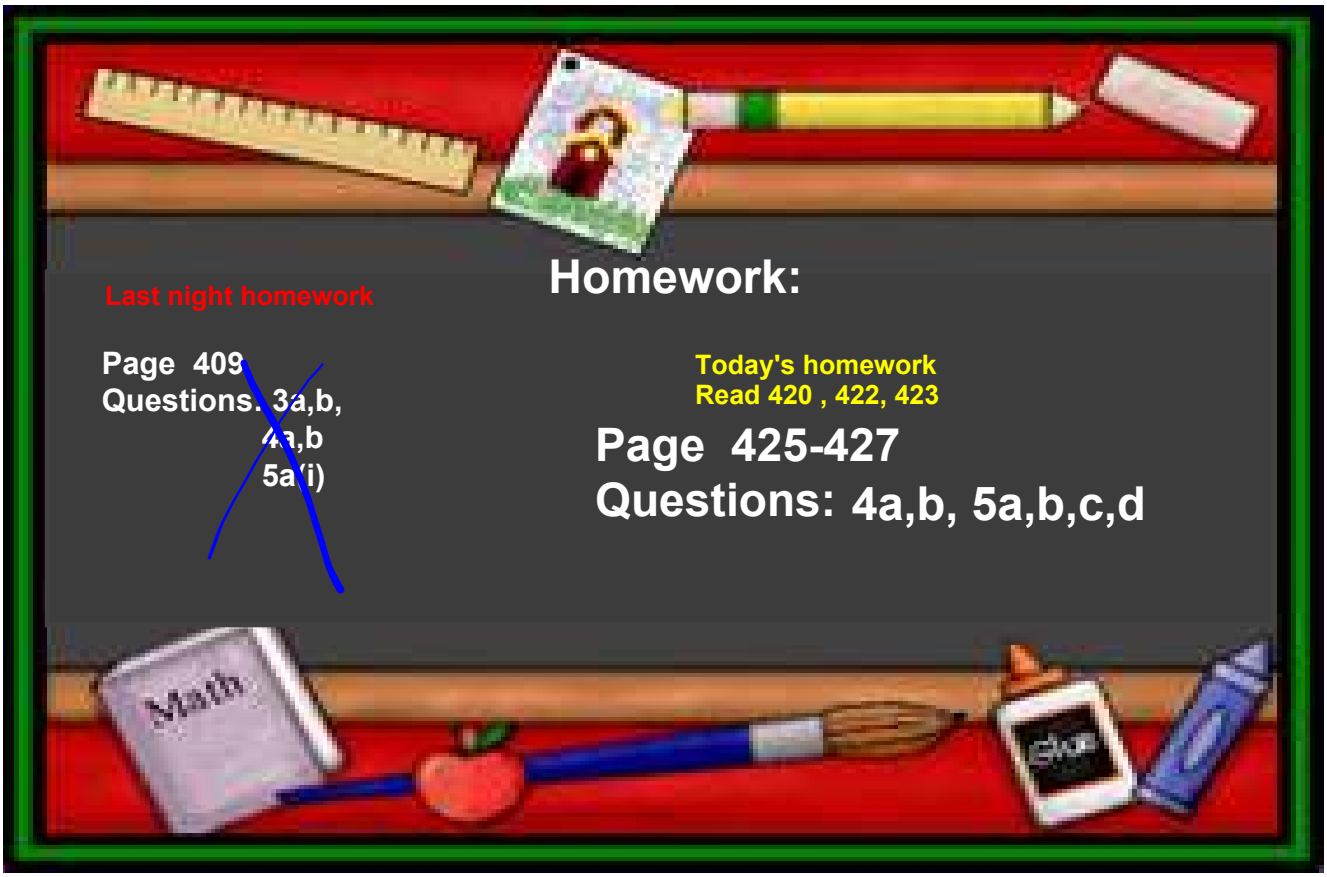
Hint: Get rid of fraction by multiplying by LCM

Solve the follwoing systems of equations using substitution

Could have used the fractions

$\frac{1}{2}x + y = \frac{5}{2}$ ⟶ ① $y = \frac{-1x}{2} + \frac{5}{2}$

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


Homework:
Last night homework
Page 409
Questions: 3a,b,
4a,b
5a(i)
Today's homework
Read 420 , 422, 423
Page 425-427
Questions: 4a,b, 5a,b,c,d
Math