Assign # 11

New (calc allowed)

Define two variables, write equations & solve

Book: Pg 138 : 43

43. The drama club @ HHS sells hot choco & coffee @ football games. At one game, they sold $200 worth of hot drinks. They need to report how many of each type they sold for their clubs records. Macha knows that they used 295 cups that night. If hot choco sells for $.75 & coffee sells for $.50, how many of each type did they sell?

x = hot chocolate $\quad x + y = 295 \quad \rightarrow y = 295 - x$

y = coffee $\quad .75x + .50y = 200$

$.75x + .50(295 - x) = 200$

$.75x + 147.5 - .5x = 200$

$.25x + 147.5 = 200$

$-147.5 \quad -147.5$

$\frac{.25x}{.25} = \frac{52.5}{.25}$

$x = 210$

$y = 295 - x$

$y = 295 - 210$

$y = 85$

They sold 210 cups of hot chocolate & 85 cups of coffee.

Packet

1. Two numbers total 4 & their difference is 10. Find the #'s.

x = 1st number $\quad x+y=4$

y = 2nd number $\quad x-y=10$

Solve using elim

$$\begin{array}{r} x+y=4 \\ +\ x-y=10 \\ \hline 2x=14 \end{array}$$

$$\frac{2x}{2}=\frac{14}{2}$$

$$x=7$$

$$\begin{array}{r} 7+y=4 \\ -7 \quad -7 \\ \hline y=-3 \end{array}$$

The two numbers are 7 and -3.

2. The sum of the ages of two boys is 18. If 4 times the younger boy's age is subtracted from 3 times the older boy's age, the diff is 12. What are their ages?

x = older boy's age $\quad x+y=18$

y = younger boy's age $\quad 3x-4y=12$

elim

$(x+y=18)4 \rightarrow 4x+4y=72$

$3x-4y=12$

$$\begin{array}{r} 4x+4y=72 \\ +\ 3x-4y=12 \\ \hline 7x=84 \end{array}$$

$$\frac{7x}{7}=\frac{84}{7}$$

$$x=12$$

$$\begin{array}{r} 12+y=18 \\ -12 \quad -12 \\ \hline y=6 \end{array}$$

The older boy is 12 & the younger boy is 6.

Assign 11 cont

3. Marty has a piggy bank that contains $2.25. The bank contains only quarters & dimes. There are twice as many dimes as quarters. How many of each are there?

x = quarters
y = dimes

$.25x + .10y = 2.25$

$y = 2x$ (you have to double the quarters to make it equal to the dimes.)

$.25x + .10(2x) = 2.25$

$.25x + .2x = 2.25$

$\frac{.45x}{.45} = \frac{2.25}{.45}$

$x = 5$

$y = 2(5)$

$y = 10$

There are 5 quarters and 10 dimes.

4. 240 pairs of tennis shoes were sold at a store in a week. One style sold for $66.95 & the other sold for $84.95. The total receipts were $17,652.00. How many of each type was sold?

x = type 1, cost $66.95
y = type 2, cost $84.95

$x + y = 240 \rightarrow y = 240 - x$

$66.95x + 84.95y = 17652$

$66.95x + 84.95(240 - x) = 17652$

$66.95x + 20,388 - 84.95x = 17652$

$-20,388 \quad\quad -20,388$

$\frac{-18x}{-18} = \frac{-2736}{-18}$

$x = 152$

$y = 240 - 152$

$y = 88$

They sold 152 at $66.95 and 88 at $84.95.

5. A total of $ 25,000 is invested into two funds paying 8% & 8.5% simple interest. If the yearly interest is $ 2060, how much is invested at each rate?

x = 8% fund
y = 8.5% fund

$x + y = 25000$
$.08x + .085y = 2060$

$y = 25000 - x$

$.08x + .085(25000 - x) = 2060$

$.08x + 2125 - .085x = 2060$
$-2125 \quad\quad -2125$

$\frac{-.005x}{-.005} = \frac{-65}{-.005}$

$x = 13000 \quad\quad y = 12000$

They invested $ 13,000 in the 8% fund and $ 12,000 in the 8.5% fund.

6. A total of $ 18,000 is invested in 2 funds paying 7.75% & 8.25% interest. If the yearly interest is $ 1455, how much is invested in each?

x = 7.75% fund
y = 8.25% fund

$x + y = 18000$
$.0775x + .0825y = 1455$

$.0775x + .0825(18000 - x) = 1455$

$.0775x + 1485 - .0825x = 1455$

$-.005x = -30$

$x = 6000 \quad\quad y = 12,000$

$600 was invested in the 7.75% fund and $12,000 in the 8.25% fund.

Assign 11 cont

Review: no calc

7. $\frac{1}{6} - \frac{2}{3} = \frac{1}{6} - \frac{4}{6} = -\frac{3}{6} = \boxed{-\frac{1}{2}}$

8. $3 + (21 \div 7) \cdot 8 \div 4$

$= 3 + 3 \cdot 8 \div 4$

$= 3 + 24 \div 4$

$= 3 + 6$

$= \boxed{9}$

solve

9. $3(6 - 5x) \leq 12x - 36$

$18 - 15x \leq 12x - 36$

$-18 \quad -12x \quad -12x \quad -18$

$\frac{-27x}{-27} \leq \frac{-54}{-27}$

$\boxed{x \geq 2}$

10. $|9 - 3y| > 5$

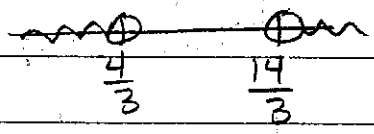
$9 - 3y > 5$ or $9 - 3y < -5$

$-9 \quad -9 \qquad -9 \quad -9$

$\frac{-3y}{-3} > \frac{-4}{-3} \qquad \frac{-3y}{-3} < \frac{-14}{-3}$

$y < \frac{4}{3} \qquad y > \frac{14}{3}$

$\boxed{y < \frac{4}{3} \text{ or } y > \frac{14}{3}}$

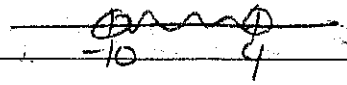


11. $|x+3| < 7$

$x+3 < 7$ $\quad$ $x+3 > -7$

$-3 \quad -3$ $\quad$ $-3 \quad -3$

$x < 4$ $\quad$ $x > -10$



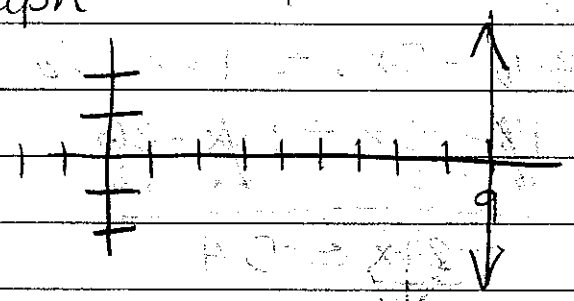
$\boxed{-10 < x < 4}$

12. Find x+y int & graph

$x = 9$

x-int: (9,0)

y-int: none



13. Find slope: (5,4), (2,2)

$m = \frac{2-4}{2-5} = \frac{-2}{-3} = \frac{2}{3}$ $\quad \boxed{m = \frac{2}{3}}$

Solve by graphing

14. $2x + 6y = 6$

x-int: (3,0)

y-int: (0,1)

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

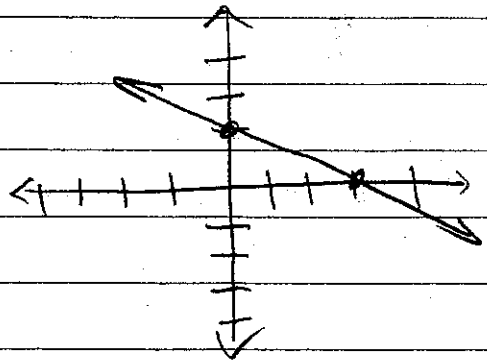
x-int: (3,0)

y-int: (0,1)

$\boxed{\text{Infinite solutions}}$

Same line

$2x + 6y = 6$



Assign 11
cont

15. $2x - y = 7$

x-int: $(\frac{7}{2}, 0)$

y-int: $(0, -7)$

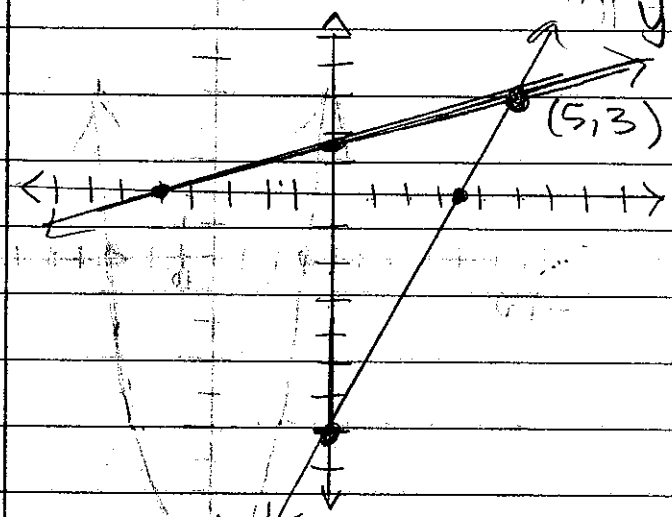
$\frac{2}{5}x - \frac{4}{3}y = -2$

x-int: $(-5, 0)$

$x = -\frac{2}{1}(\frac{5}{2}) = -5$

y-int: $(0, \frac{3}{2})$

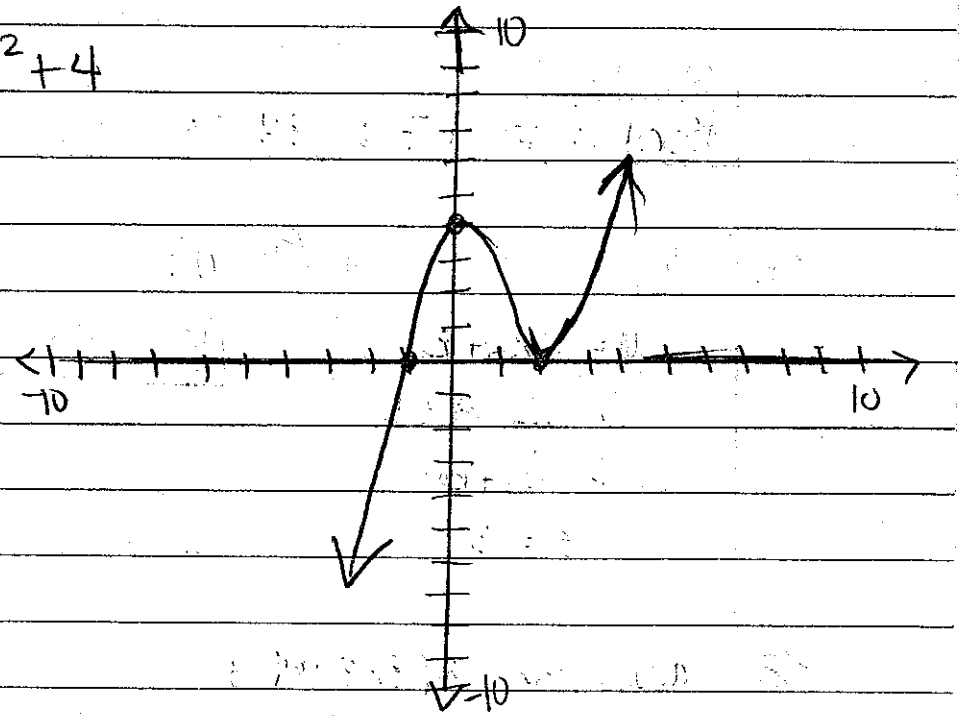
$y = -\frac{2}{1}(-\frac{3}{4}) = \frac{3}{2}$



$(5, 3)$

16. Calculator

$y = x^3 - 3x^2 + 4$



x-int: $(-1, 0)$
$(2, 0)$

y-int: $(0, 4)$

$y = 0^3 - 3(0)^2 + 4$

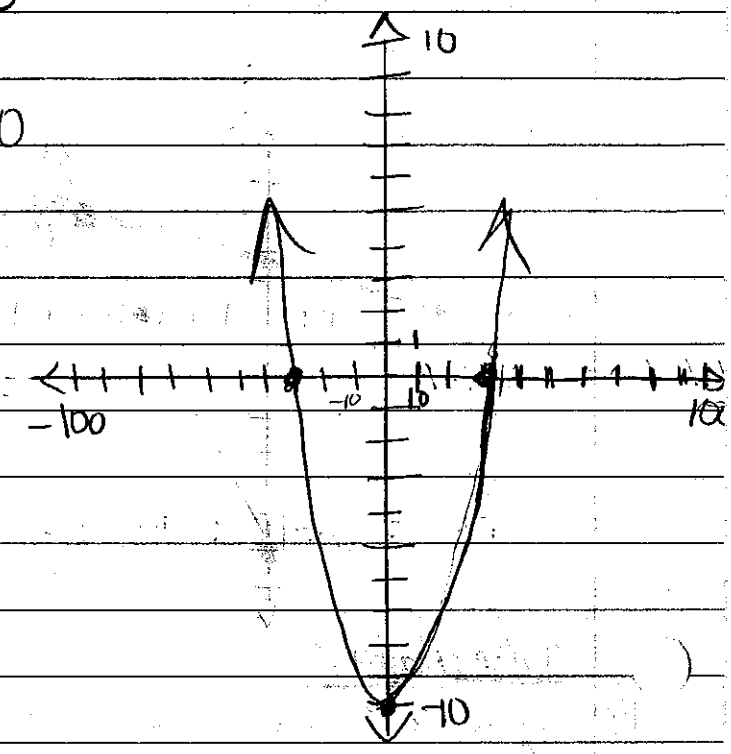
$y = 0 - 0 + 4$

$y = 4$

17. $x^2 - 100y - 1000 = 0$

$\frac{-100y}{-100} = \frac{-x^2 + 1000}{-100}$

$y = \frac{1}{100}x^2 - 10$



x-int: $(-30, 0)$
$(30, 0)$

y-int: $(0, -10)$

$y = \frac{1}{100}(0) - 10$

$y = 0 - 10$

$y = -10$

No calc

Book: pg 117: 34, 35, 38, 40

34. Slope $= 2$ x-int: $(\frac{3}{2}, 0)$

$y = 2x + b$

$0 = \frac{2}{1}(\frac{3}{2}) + b$

$0 = 3 + b$

$-3 = b$

$y = 2x - 3$

35. passes through $(3, -8)$ and $(-3, 2)$

$m = \frac{2 - -8}{-3 - 3} = \frac{10}{-6} = \frac{-5}{3}$

$y = -\frac{5}{3}x + b$

$-8 = -\frac{5}{3}(3) + b$

$+5 \quad +5$

$b = -3$

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

Assign 11 cont

38. passes through $(-1,2)$ & parallel to $x-3y=14$

$m=\frac{1}{3}$

$y=\frac{1}{3}x+b$

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

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

$+\frac{1}{3}\quad+\frac{1}{3}$

$\frac{6}{3}+\frac{1}{3}=b$

$\frac{7}{3}=b$

$\frac{-3y}{-3}=\frac{-x+14}{-3}$

$y=\frac{1}{3}x-\frac{14}{3}$

$\boxed{y=\frac{1}{3}x+\frac{7}{3}}$

40. passes through $(1,3)$ and is perp to $y=-\frac{2}{3}x+\frac{11}{3}$

$m=\frac{3}{2}$

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

$3=\frac{3}{2}(1)+b$

$\frac{3}{1}=\frac{3}{2}+b$

$\frac{6}{2}-\frac{3}{2}=b$

$\frac{3}{2}=b$

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

No calc

Book pg 137: 16, 22, 28, 32

16. $x+3y=13$ $\rightarrow$ $x=-3y+13$ Solve by sub

$-3x+2y=27$

$-3(-3y+13)+2y=27$

$9y-39+2y=27$

$+39\quad\quad+39$

$\frac{11y}{11}=\frac{66}{11}$

$y=6$

$x+3(6)=13$

$x+18=13$

$x=-5$

$\boxed{(-5,6)}$

solve by elim.

22. $3x-4y=1$

$(5x+2y=45)2 \rightarrow 10x+4y=90$

$13x = 91$

$\frac{13x}{13} = \frac{91}{13}$

$x=7$

$3(7)-4y=1$

$21-4y=1$

$-21 \quad -21$

$-4y=-20$

$\frac{-4y}{-4} = \frac{-20}{-4}$

$y=5$

$(7,5)$

28. $(2p-5q=-53)-3 \rightarrow -6p+15q=159$

$6p+7q=39$

$6p+7q=39$

$22q = 198$

$\frac{22q}{22} = \frac{198}{22}$

$q=9$

$6p+7(9)=39$

$6p+63=39$

$-63 \quad -63$

$6p=-24$

$\frac{6p}{6} = \frac{-24}{6}$

$p=-4$

$(-4,9)$

32. $5s-t=2$

$t=4s+3$

$5s-(4s+3)=2$

$5s-4s-3=2$

$+3 \quad +3$

$s=5$

$t=4(5)+3$

$t=20+3$

$t=23$

$(5,23)$

Assign 11 cont.

Book pg 125: 4 (calc)

4. $y = -x + 7$

$8 = 2x - y \rightarrow y = 2x - 8$

$(5, 2)$