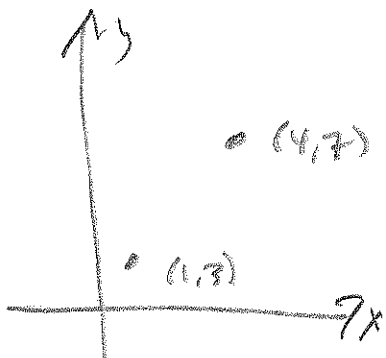


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§ 1.3 #5 1-8, 9-17 odds, 19, 23, 26, 27, 30, 31,
 #5 19-32 Plot Points, Find distance between them 33, 35, 41, 44, 47, 51, 54,
 and midpoint of line segment joining them 55, 63, 66,
 67, 69, 72,
 73, 77, 79, 80
 90, 91

19 (1, 3), (4, 7)



$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(4 - 1)^2 + (7 - 3)^2}$$

$$= \sqrt{3^2 + 4^2}$$

$$= \sqrt{9 + 16}$$

$$= \sqrt{25} = \boxed{5 = D}$$

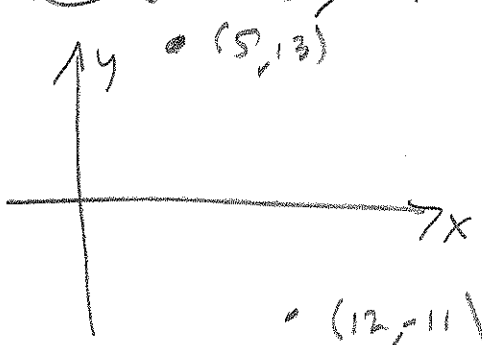
$$\text{mid} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left(\frac{1+4}{2}, \frac{3+7}{2} \right)$$

$$= \left(\frac{5}{2}, \frac{10}{2} \right)$$

$$= \left(\frac{5}{2}, 5 \right) = \boxed{\text{mid}}$$

23 (12, -11), (5, 13)



$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(5 - 12)^2 + (13 - (-11))^2}$$

$$= \sqrt{(-7)^2 + (24)^2}$$

$$= \sqrt{49 + 576}$$

$$= \sqrt{625} = \boxed{25 = D}$$

$$\begin{array}{r} 24 \\ 24 \\ \hline 48 \\ 576 \\ \hline 624 \\ 49 \\ \hline 673 \end{array}$$

$$\text{mid} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left(\frac{12+5}{2}, \frac{-11+13}{2} \right)$$

$$= \left(\frac{17}{2}, \frac{2}{2} \right) = \boxed{\left(\frac{17}{2}, 1 \right) = \text{mid}}$$

#5 1-8 ALL, 9-17 ODDS
 19, 23, 26, 27, 30, 31, 33,
 35, 41, 44, 47, 51, 54,
 55, 63, 66, 67, 69, 72,
 73, 77, 79, 80, 90, 91

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(26) $(1+\sqrt{2}, -2), (1-\sqrt{2}, 2)$

$$D = \sqrt{(1-\sqrt{2} - (1+\sqrt{2}))^2 + (-2 - (-2))^2}$$

$$= \sqrt{(1-\sqrt{2} - 1 - \sqrt{2})^2 + (-2 + 2)^2}$$

$$= \sqrt{(-2\sqrt{2})^2 + 4^2}$$

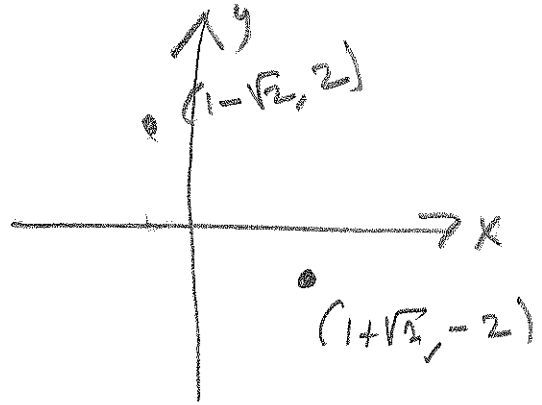
$$= \sqrt{8 + 16} = \sqrt{24}$$

$$= \boxed{2\sqrt{6} = D}$$

2/24
2/12
2/6
3

$$\text{MID} = \left(\frac{1+\sqrt{2} + 1-\sqrt{2}}{2}, \frac{-2-2}{2} \right)$$

$$= \left(\frac{2}{2}, -\frac{4}{2} \right) = \boxed{(1, -2) = \text{MID}}$$

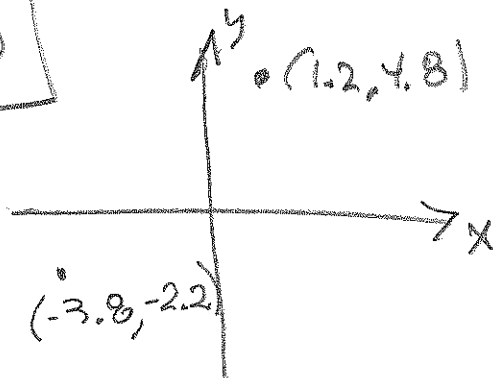


(27) $(1.2, 4.8), (-3.8, -2.2)$

$$D = \sqrt{(-3.8 - 1.2)^2 + (-2.2 - 4.8)^2}$$

$$= \sqrt{(-5)^2 + (-7)^2} = \sqrt{25 + 49}$$

$$= \boxed{\sqrt{74} = D}$$



2/74
37

MID =

$$\left(\frac{1.2 - 3.8}{2}, \frac{4.8 - 2.2}{2} \right)$$

$$= \left(\frac{-2.6}{2}, \frac{2.6}{2} \right)$$

$$= \boxed{(-1.3, 1.3) = \text{MID}}$$

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$$(30) (a, 0), \left(\frac{a+b}{2}, 0\right)$$

$$D = \sqrt{\left(\frac{a+b}{2} - a\right)^2 + (0-0)^2}$$

$$= \sqrt{\left(\frac{a+b-2a}{2}\right)^2}$$

$$= \sqrt{\left(\frac{b-a}{2}\right)^2} = \sqrt{\frac{(b-a)^2}{2^2}}$$

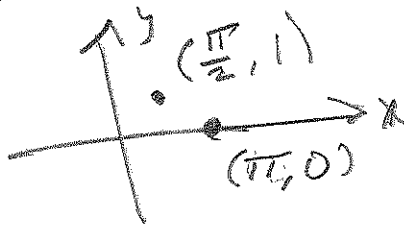
$$= \frac{\sqrt{(b-a)^2}}{\sqrt{2}} = \boxed{\frac{|b-a|}{2} = D}$$

$$\text{MID} = \left(\frac{a + \frac{a+b}{2}}{2}, \frac{0+0}{2}\right)$$

$$= \left(\frac{2a + a+b}{2}, 0\right)$$

$$= \boxed{\left(\frac{3a+b}{4}, 0\right)}$$

$$(31) (\pi, 0), \left(\frac{\pi}{2}, 1\right)$$



$$D = \sqrt{\left(\pi - \frac{\pi}{2}\right)^2 + (0-1)^2}$$

$$= \sqrt{\left(\frac{\pi}{2}\right)^2 + (-1)^2} = \sqrt{\frac{\pi^2}{4} + 1}$$

$$= \sqrt{\frac{\pi^2 + 4}{4}} = \frac{\sqrt{\pi^2 + 4}}{\sqrt{4}} = \boxed{\frac{\sqrt{\pi^2 + 4}}{2} = D}$$

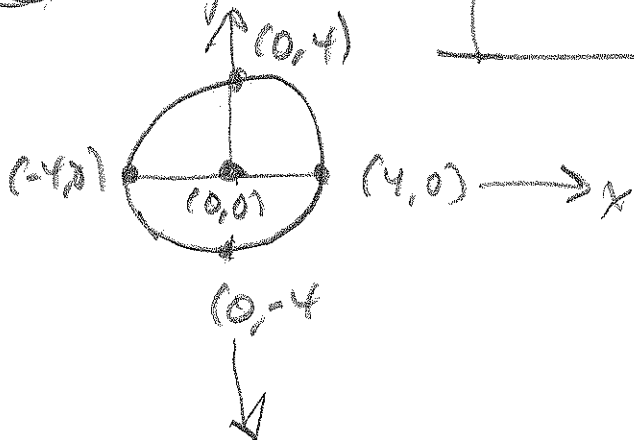
$$\text{MID} = \left(\frac{\pi + \frac{\pi}{2}}{2}, \frac{0+1}{2}\right)$$

$$= \left(\frac{3\pi}{4}, \frac{1}{2}\right) = \boxed{\left(\frac{3\pi}{4}, \frac{1}{2}\right) = \text{MID}}$$

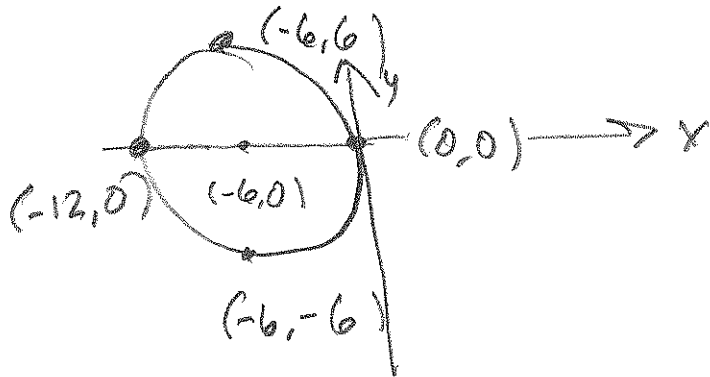
#S 33-40 Determine center & radius of the circle, Sketch.

33) $x^2 + y^2 = 16$

$$(h, k) = (0, 0), r = 4$$



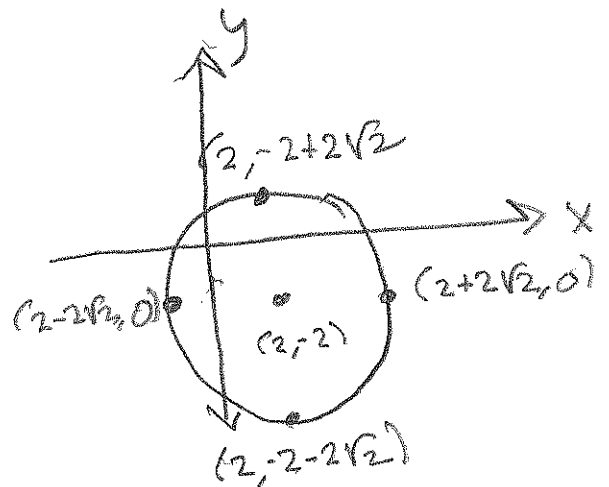
38) $(x+6)^2 + y^2 = 36$ $(h, k) = (-6, 0), r = 6$



39) $(x-2)^2 = 8 - (y+2)^2$

$$(x-2)^2 + (y+2)^2 = 8$$

$$(h, k) = (2, -2), r = \sqrt{8} = 2\sqrt{2}$$



#s 41-48 Write standard equation of circle.

(41) $(h,k) = (0,0), r=7 \implies x^2 + y^2 = 49$

(44) $(h,k) = (-1,-6), r = \frac{1}{3} \implies (x+1)^2 + (y+6)^2 = \frac{1}{9}$

(47) $(h,k) = (5,-1)$ & contains $(1,3)$

$D = \sqrt{(5-1)^2 + (-1-3)^2} = r$

$= \sqrt{4^2 + 4^2} = \sqrt{32} = 4\sqrt{2}$

- 2/32
- 2/16
- 2/8
- 2/4

$(x-5)^2 + (y+1)^2 = 32$

Didn't need r. Just its square.

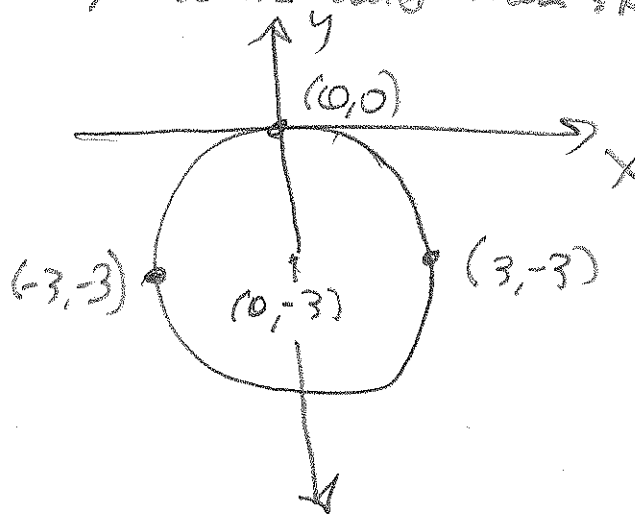
#s 49-62 Determine center, radius and then sketch.

(51) $x^2 + y^2 + 6y = 0$

$x^2 + y^2 + 6y + 3^2 = 9$

$x^2 + (y+3)^2 = 9$

$(h,k) = (0,-3), r=3$



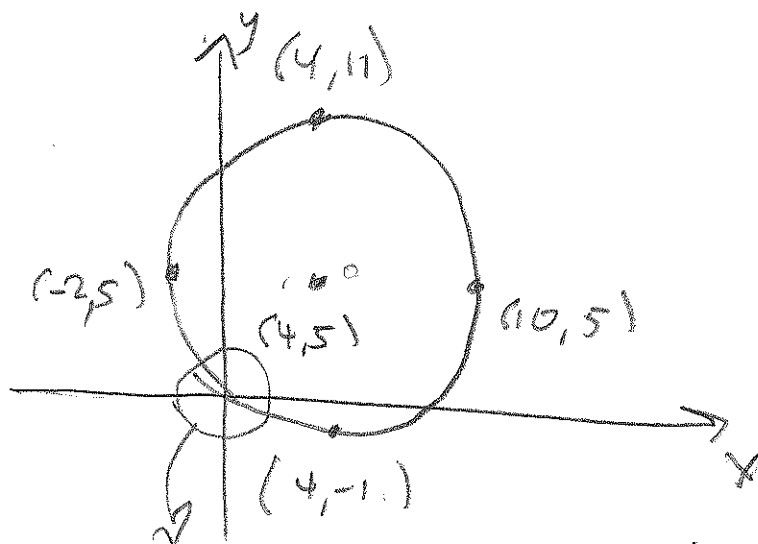
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$$(54) \quad x^2 - 8x + y^2 - 10y = -5$$

$$x^2 - 8x + 4^2 + y^2 - 10y + 5^2 = -5 + 16 + 25$$

$$(x-4)^2 + (y-5)^2 = 36$$

$$(h, k) = (4, 5), r = 6$$



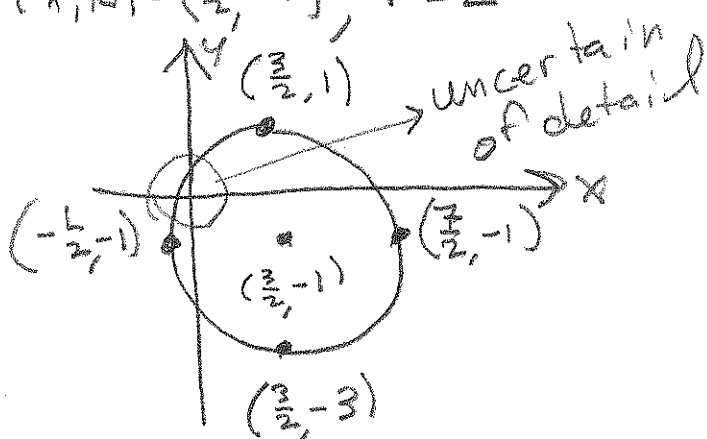
This is sketchy, until we nail down intercepts.

$$(55) \quad x^2 - 3x + y^2 + 2y = \frac{3}{4}$$

$$x^2 - 3x + \left(\frac{3}{2}\right)^2 + y^2 + 2y + 1^2 = \frac{3}{4} + \frac{9}{4} + 1$$

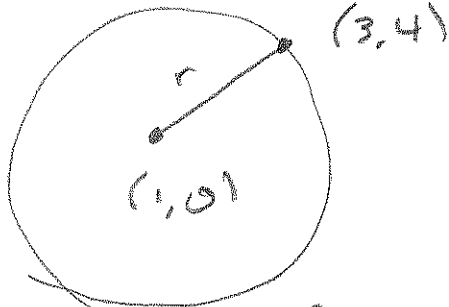
$$\left(x - \frac{3}{2}\right)^2 + (y+1)^2 = \frac{16}{4} = 4$$

$$(h, k) = \left(\frac{3}{2}, -1\right), r = 2$$



#563-66 Write standard form of equation for the circle shown

(63) (b)



$$\begin{aligned}
 r &= \sqrt{(3-1)^2 + (4-0)^2} \\
 &= \sqrt{2^2 + 4^2} \\
 &= \sqrt{4 + 16} \\
 &= \sqrt{20} \\
 &= 2\sqrt{5} = r
 \end{aligned}$$

$\begin{array}{l} 2 \cancel{2} 0 \\ 2 \cancel{1} 0 \\ \hline 5 \end{array}$
 \downarrow
 $2\sqrt{5}$

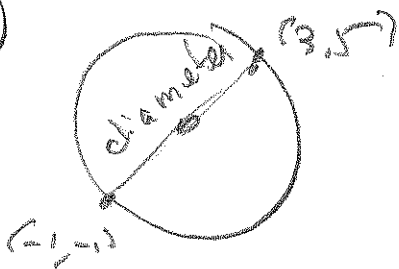
Could've just gone for r^2 ,

since that's what we need for the equation, plus it'd be easier!

$$(h, k) = (1, 0), r = 2\sqrt{5} \rightarrow r^2 = 4 \cdot 5 = 20$$

$$(x-1)^2 + y^2 = 20$$

(c)



$$\begin{aligned}
 D &= 2r = \sqrt{(3-(-1))^2 + (5-(-1))^2} \\
 &= \sqrt{4^2 + 6^2} = \sqrt{16 + 36} = \sqrt{52}
 \end{aligned}$$

$$= 2\sqrt{13} = 2r \rightarrow$$

$$r = \sqrt{13}$$

$$\begin{array}{l} 2 \sqrt{52} \\ 2 \sqrt{26} \\ \hline 13 \end{array}$$

$$\text{mid} = \left(\frac{-1+3}{2}, \frac{5-1}{2} \right)$$

$$= \left(\frac{2}{2}, \frac{4}{2} \right) = (1, 2) = (h, k)$$

$$(x-1)^2 + (y-2)^2 = 13$$

$$\text{Alternative } D^2 = (2r)^2 = 4r^2 = (3-(-1))^2 + (5-(-1))^2$$

$$= 4^2 + 6^2 = 16 + 36 = 52 = 4r^2 \Rightarrow r^2 = \frac{52}{4} = 13 = r^2$$

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#5 67-78 Sketch the graph. Include intercepts

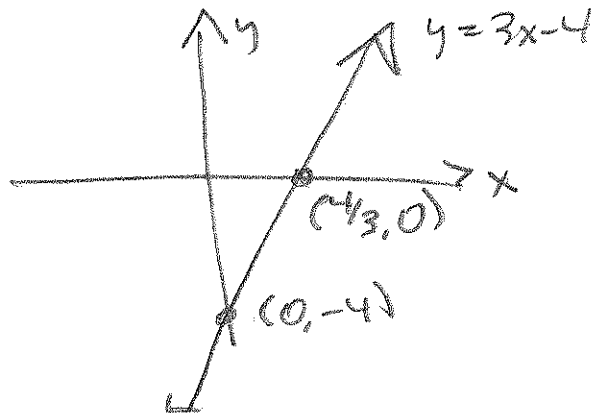
(67) $y = 3x - 4$

x	y
0	-4
$\frac{4}{3}$	0

$$3x - 4 = 0$$

$$3x = 4$$

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

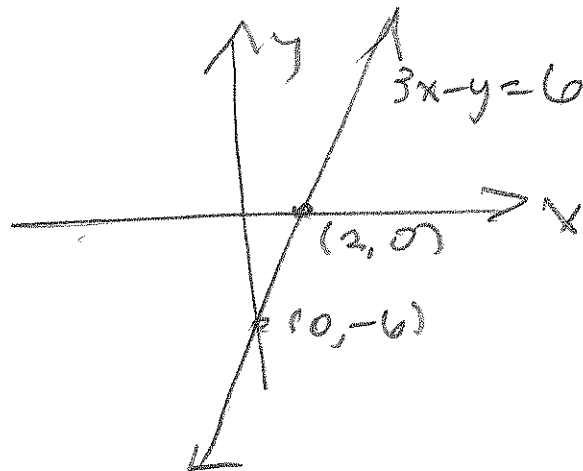


(69) $3x - y = 6$

x	y
0	-6
2	0

$$-y = 6 \quad 3x = 6$$

$$y = -6 \quad x = 2$$



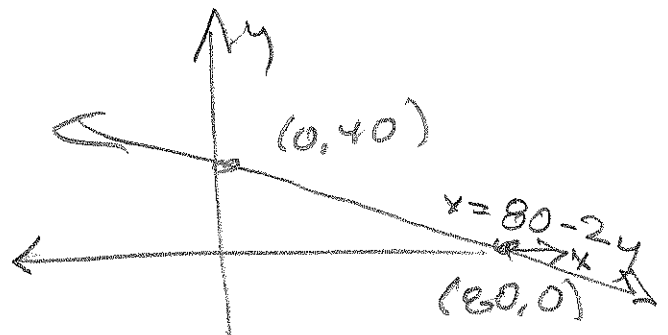
(72) $x = 80 - 2y$

x	y
0	40
80	0

$$80 - 2y = 0 \quad x = 80$$

$$-2y = -80$$

$$y = \frac{-80}{-2} = 40$$



(73) $\frac{2}{3}y - \frac{1}{2}x = 400$ LCM: 6

$$\left(\frac{6}{1}\right)\left(\frac{2}{3}\right)y - \left(\frac{6}{1}\right)\left(\frac{1}{2}\right)x = (6)(400)$$

$$4y - 3x = 2400$$

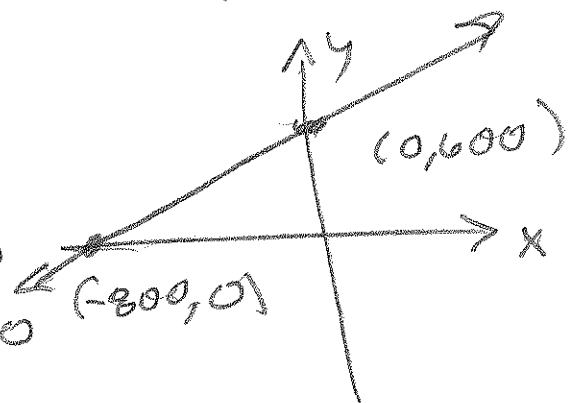
x	y
0	600
-800	0

$$4y = 2400$$

$$y = 600$$

$$-3x = 2400$$

$$x = -800$$



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(77) $.03x + .06y = 150$

LCD = 100 ↓
 $.03 = \frac{3}{100}$
 $.06 = \frac{6}{100}$

$(100)(.03x) + (100)(.06y) = 100(150)$

$3x + 6y = 15000$

$$\begin{array}{r} 7500 \\ 15000 \\ \hline 6 \\ 3 \end{array} \quad \begin{array}{r} 2500 \\ 7500 \\ \hline 3 \\ 1 \end{array}$$

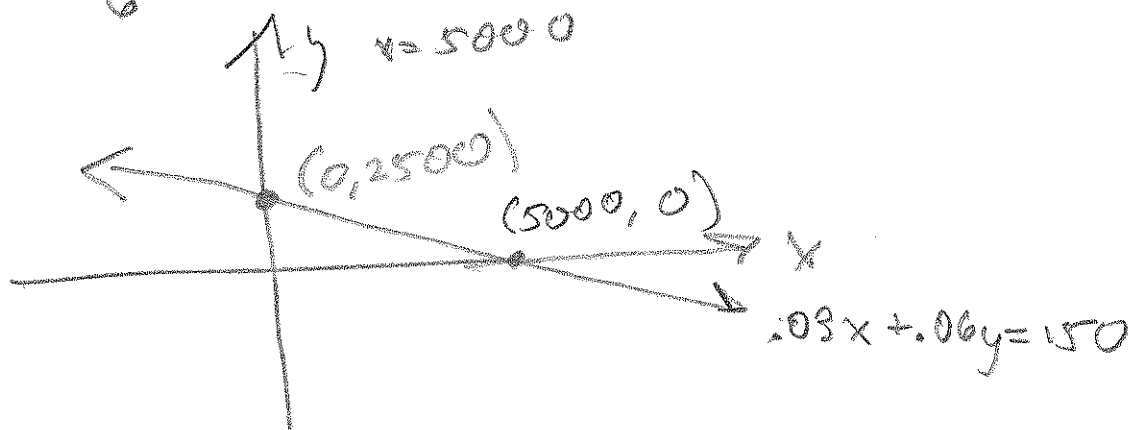
$6y = 15000$

$y = \frac{15000}{6}$

$3x = 15000$

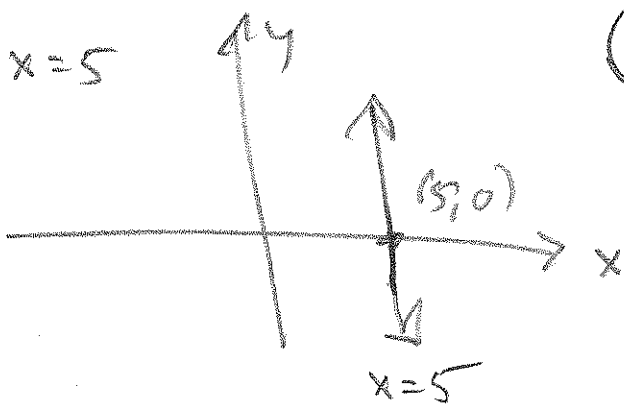
$x = 5000$

x	y
0	2500
5000	0

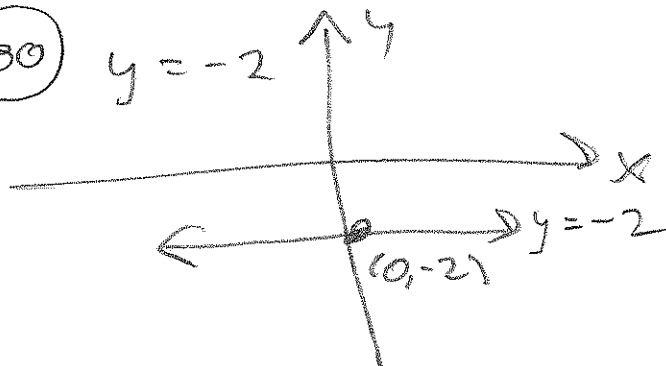


#s 79-86 GRAPH IN the plane

(79) $x = 5$



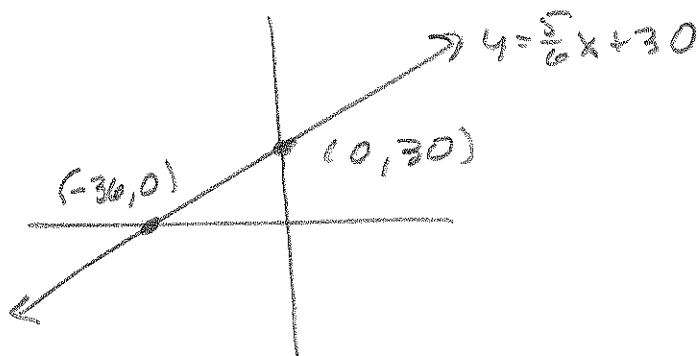
(80) $y = -2$



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*587-90 Solve eq'n by reading graph

(90) $\frac{5}{6}x + 30 = 0 \rightarrow \boxed{x = -36}$ by inspection.

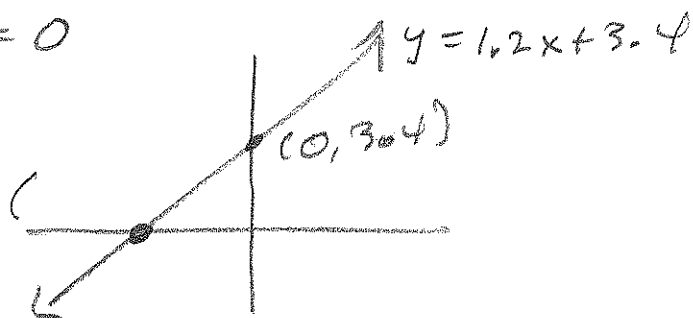


*591 Use Graphing Calculator to estimate the solutions. Then solve algebraically.

(91) $1.2x + 3.4 = 0$

Grapher says

$x \approx -2.83$



Algebra says ~

$1.2x + 3.4 = 0$

$1.2x = -3.4$

$x = -\frac{3.4}{1.2} = -\frac{34}{12} = \boxed{-\frac{17}{6} = x}$