#4) C: $(-2,-1)$, D: $(4,9)$

length: $d = \sqrt{(4+2)^2 + (9+1)^2} = \sqrt{36+100} = \sqrt{136} = \sqrt{4 \cdot 34} = 2\sqrt{34}$

midpoint: $\left(\frac{-2+4}{2}, \frac{-1+9}{2}\right) = \left(\frac{2}{2}, \frac{8}{2}\right) = (1,4)$

#5) C: $\left(\frac{1}{2}, \frac{9}{2}\right)$, D: $\left(-2, -\frac{3}{2}\right)$

length: $d = \sqrt{\left(-2-\frac{1}{2}\right)^2 + \left(-\frac{3}{2}-\frac{9}{2}\right)^2} = \sqrt{\left(-\frac{5}{2}\right)^2 + (-6)^2} = \sqrt{\frac{25}{4}+36}$

$= \sqrt{\frac{25}{4}+\frac{144}{4}} = \sqrt{\frac{169}{4}} = \frac{13}{2}$

midpt: $\left(\frac{\frac{1}{2}+(-2)}{2}, \frac{\frac{9}{2}+\left(-\frac{3}{2}\right)}{2}\right)$

$\left(\frac{\frac{1}{2}-\frac{4}{2}}{2}, \frac{\frac{9}{2}-\frac{3}{2}}{2}\right) = \left(\frac{-\frac{3}{2}}{2}, \frac{\frac{6}{2}}{2}\right) = \left(-\frac{3}{4}, \frac{3}{2}\right)$

#9) $3x - 2y = 15$

a) $(9,6)$ $3(9)-2(6)=15$ $27-12=15$ $15=15$ ✓✓

b) $(8,4)$ $3(8)-2(4)=15$ $24-8=15$ $16=15$ No!!

c) $\left(-\frac{4}{3}, -\frac{19}{2}\right)$ $3\left(-\frac{4}{3}\right)-2\left(-\frac{19}{2}\right)=15$ $-4+19=15$ $15=15$ ✓✓

d) $(3.4, -3.2)$ $3(3.4)-2(-3.2)=15$ $10.2+6.4=15$ $16.6=15$ No!!

e) $(-9,-22)$ $3(-9)-2(-22)=15$ $-27+44=15$ $17=15$ No!!

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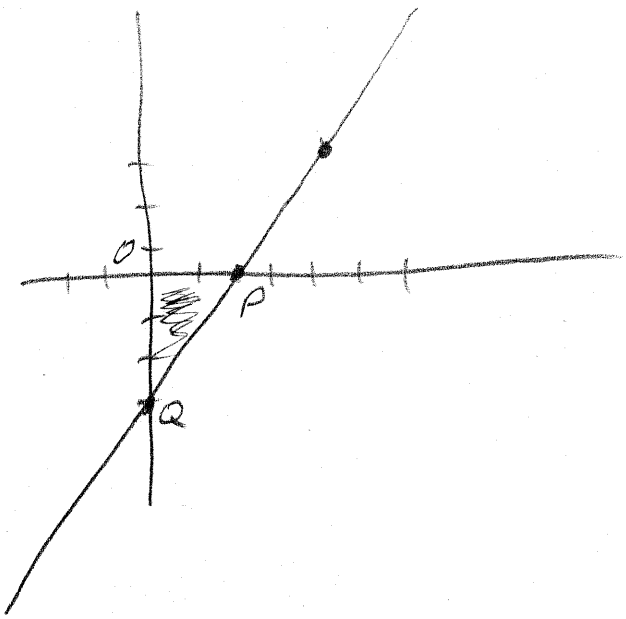
#11) $3x - 2y = 6$

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

x-int: (2,0) (P)

y-int: (0,−3) (Q)

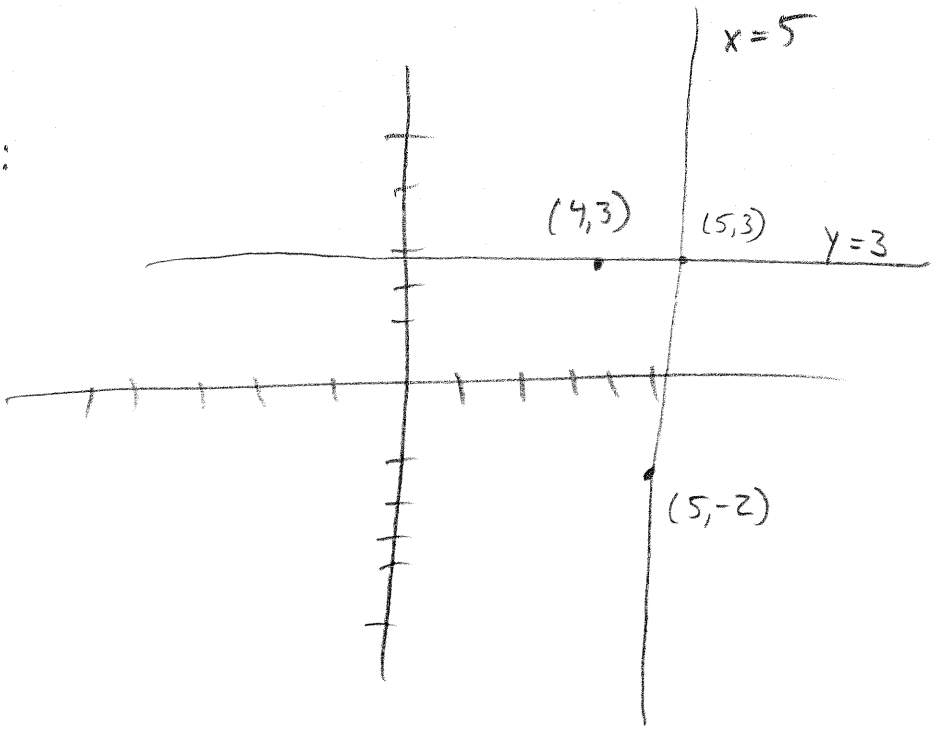


$\text{Area}_{\triangle OPQ} = \frac{1}{2}(2)(3) = 3 \text{ un}^2$

#13)

point of intersection:

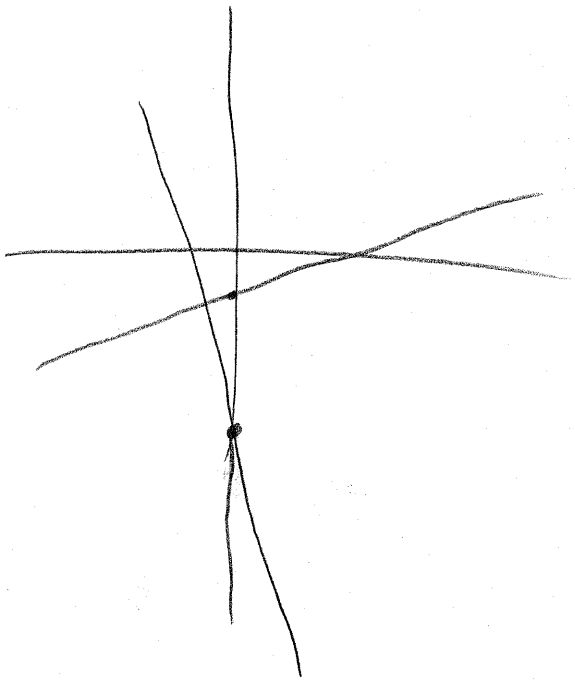
(5,3)



pg. 5

#17) [1] $x - 3y = 4$ $\quad y = \frac{1}{3}x - \frac{4}{3}$

[2] $5x + y = -8$ $\quad y = -5x - 8$



$x - 3y = 4$

$15x + 3y = -24$

$16x = -20$

$x = -\frac{20}{16}$ $\quad x = -\frac{5}{4}$

$5\left(-\frac{5}{4}\right) + y = -8$

$-\frac{25}{4} + y = -8$

$-25 + 4y = -32$

$4y = -7$

$y = -\frac{7}{4}$

$\left(-\frac{5}{4}, -\frac{7}{4}\right)$

#25) next page

#25a) Show P(4,2) is equidistant from A(9,2) and B(1,6)

PA: $\sqrt{(9-4)^2+(2-2)^2} = \sqrt{25+0} = \sqrt{25} = 5$

PB: $\sqrt{(1-4)^2+(6-2)^2} = \sqrt{9+16} = \sqrt{25} = 5$

#25b) (2,k) is equidistant from A and B

$$\sqrt{(2-9)^2+(k-2)^2} = \sqrt{(2-1)^2+(k-6)^2}$$

$$\sqrt{49+k^2-4k+4} = \sqrt{1+k^2-12k+36}$$

$$\sqrt{k^2-4k+53} = \sqrt{k^2-12k+37}$$

$$k^2-4k+53 = k^2-12k+37$$

$$-4k+53 = -12k+37$$

$$8k = -16$$

$$k = -2$$

p.11

#3) $(-4,-2), (2,-6)$ $\quad m = \frac{-6+2}{2+4} = -\frac{4}{6} = -\frac{2}{3}$

#6) $(-3,8), (-3,-2)$ $\quad m = \frac{-2-8}{-3+3} = \frac{-10}{0}$ = No slope

#9) $(a,b), (b,a)$ $\quad m = \frac{a-b}{b-a} = \frac{a-b}{-1(a-b)} = \frac{1}{-1} = -1$

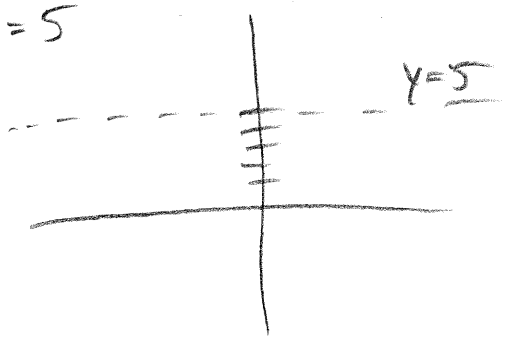
#13) $4x - 2y = 8$

$-2y = -4x + 8$

$y = 2x - 4$

slope = 2 ; y-int. = -4

#16) $y = 5$



slope = 0

y-int = 5

#17) a) $y = \frac{5}{2}x - 8$ $\quad m = \frac{5}{2}$

b) $-15x + 6y - 10 = 0$ $\quad m = \frac{15}{6} = \frac{5}{2}$

c) $4x + 10y = 15$ $\quad m = -\frac{4}{10} = -\frac{2}{5}$

$a \parallel b$, $a \perp c$, $b \perp c$

p.16

#1) slope = -2

y-int = 8

$y = -2x + 8$

$2x + y = 8$

#3) y-int: 4

x-int: -2

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

$-2x + y = 4$

$2x - y = -4$

#5) $(-1, 4)$ $(5, 8)$

$m = \frac{8-4}{5+1} = \frac{4}{6} = \frac{2}{3}$

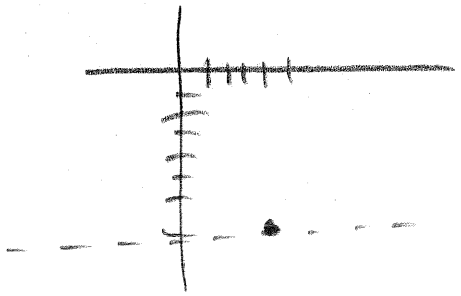
$y - 8 = \frac{2}{3}(x - 5)$

$3y - 24 = 2x - 10$

$-2x + 3y = 14$

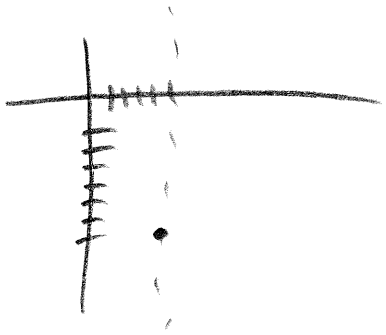
$2x - 3y = -14$

#7) horizontal line through $(5, -7)$



$y = -7$

#8) vertical line through $(5, -7)$



$x = 5$

p.16

Parallel to:

#11) $0.3x - 1.2y = 6.4$ with y-int 1.8

$m = \frac{0.3}{1.2} = \frac{1}{4}$

$y = \frac{1}{4}x + 1.8$

$4y = x + 7.2$

$-x + 4y = 7.2$

$x - 4y = -7.2$

$10x - 40y = -72$

$\boxed{5x - 20y = -36}$

or

$\boxed{25x - 100y = -180}$

or

$\boxed{0.3x - 1.2y = -2.16}$

or

$\boxed{0.25x - y = -1.8}$

#13) through $(8, -2)$

$\perp$ to $y = 7 - 2x$

$m = -2$

$\perp m = \frac{1}{2}$

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

$2y + 4 = x - 8$

$-x + 2y = -12$

$\boxed{x - 2y = 12}$

#15) $\perp$ bisector of $(0, 3)$ and $(-4, 5)$

midpoint: $\left(\frac{0-4}{2}, \frac{3+5}{2}\right) \Rightarrow \left(\frac{-4}{2}, \frac{8}{2}\right) \Rightarrow (-2, 4)$

slope: $m = \frac{5-3}{-4-0} = \frac{2}{-4} = -\frac{1}{2}$

$\perp$ slope: 2

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

$y - 4 = 2x + 4$

$-2x + y = 8$

$\boxed{2x - y = -8}$