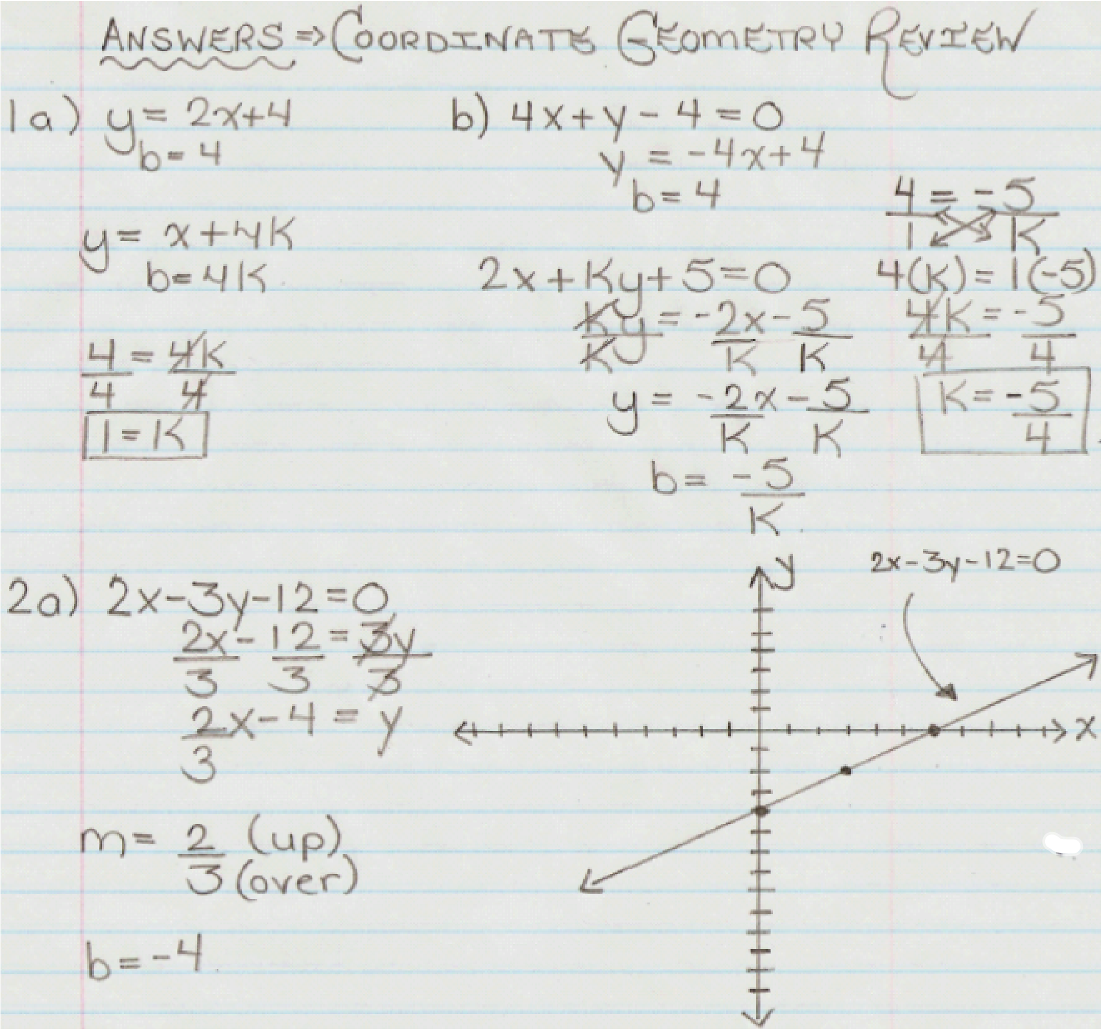


ANSWERS ⇒ COORDINATE GEOMETRY REVIEW

1a) $y = 2x+4$

$b = 4$

$y = x + 4K$

$b = 4K$

$\frac{4}{4} = \frac{\cancel{4}K}{\cancel{4}}$

$\boxed{1 = K}$

b) $4x + y - 4 = 0$

$y = -4x + 4$

$b = 4$

$2x + Ky + 5 = 0$

$\frac{\cancel{Ky}}{\cancel{K}} = -\frac{2x}{K} - \frac{5}{K}$

$y = -\frac{2x}{K} - \frac{5}{K}$

$b = \frac{-5}{K}$

$\frac{4}{1} = \frac{-5}{K}$

$4(K) = 1(-5)$

$\frac{\cancel{4}K}{\cancel{4}} = \frac{-5}{4}$

$\boxed{K = \frac{-5}{4}}$

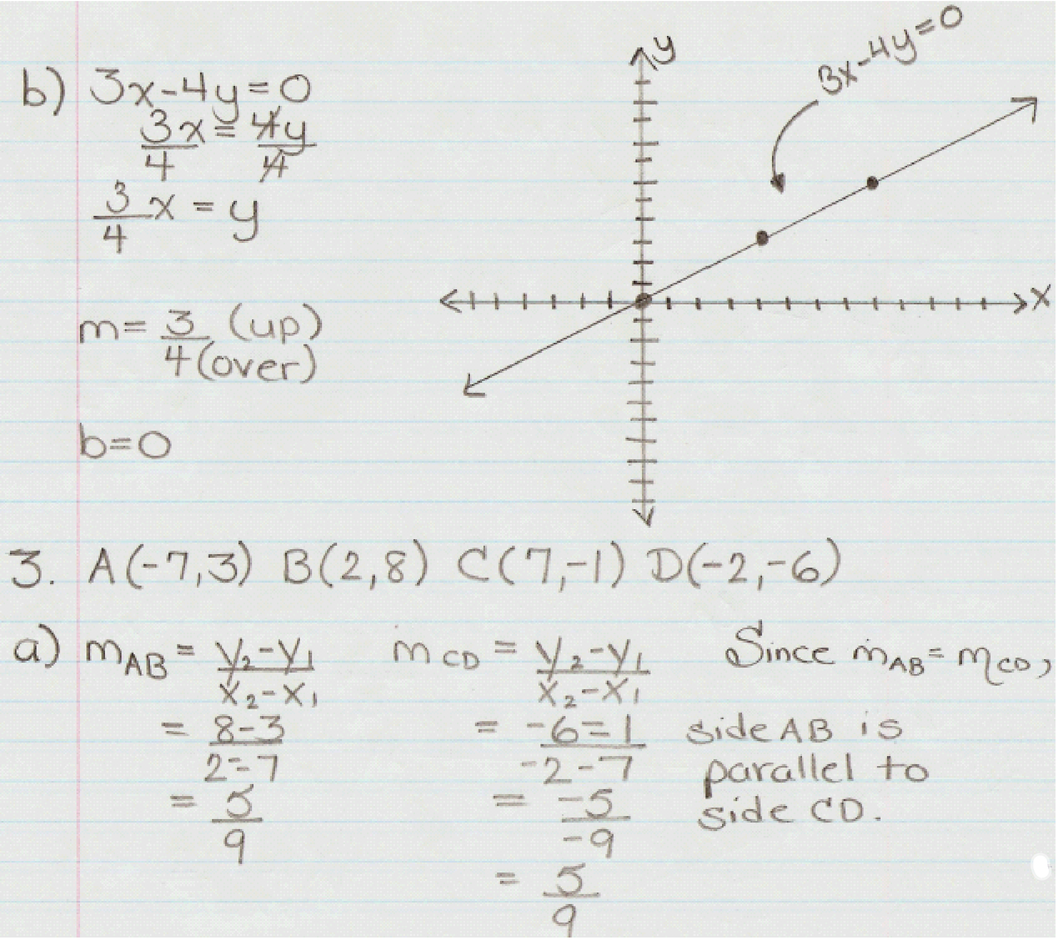
2a) $2x - 3y - 12 = 0$

$\frac{2x}{3} - \frac{12}{3} = \frac{\cancel{3}y}{\cancel{3}}$

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

$m = \frac{2\ \text{(up)}}{3\ \text{(over)}}$

$b = -4$



b) $3x-4y=0$

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

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

$$m=\frac{3\text{ (up)}}{4\text{(over)}}$$

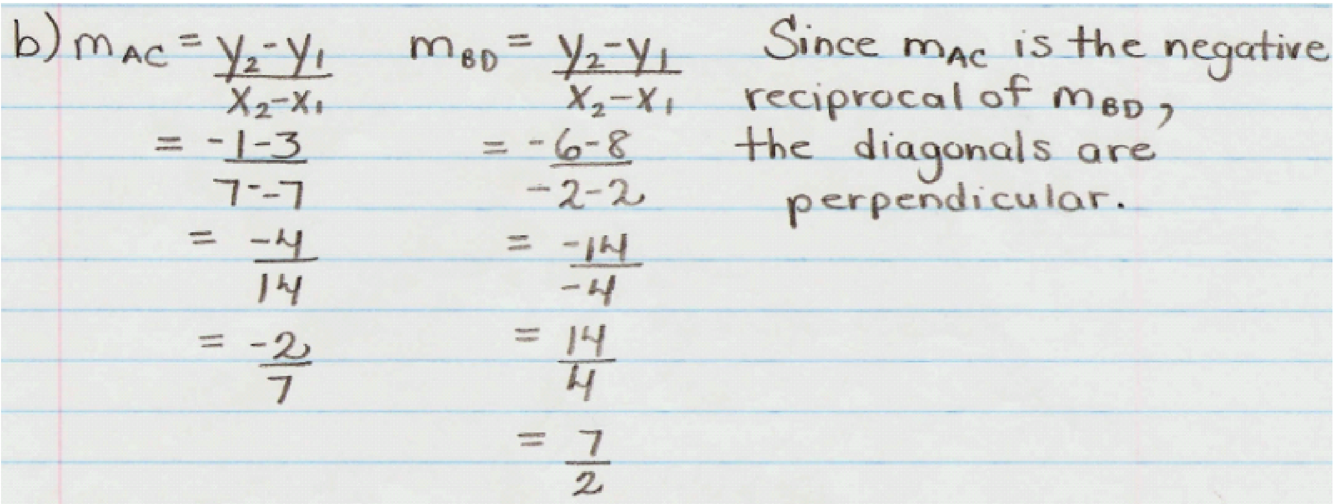
$b=0$

3. A(-7,3) B(2,8) C(7,-1) D(-2,-6)

a) $$m_{AB}=\frac{y_2-y_1}{x_2-x_1}=\frac{8-3}{2=7}=\frac{5}{9}$$

$$m_{CD}=\frac{y_2-y_1}{x_2-x_1}=\frac{-6=1}{-2-7}=\frac{-5}{-9}=\frac{5}{9}$$

Since $m_{AB}=m_{CD}$, side AB is parallel to side CD.



b) $m_{AC} = \frac{y_2-y_1}{x_2-x_1}$

$= \frac{-1-3}{7--7}$

$= \frac{-4}{14}$

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

$m_{BD} = \frac{y_2-y_1}{x_2-x_1}$

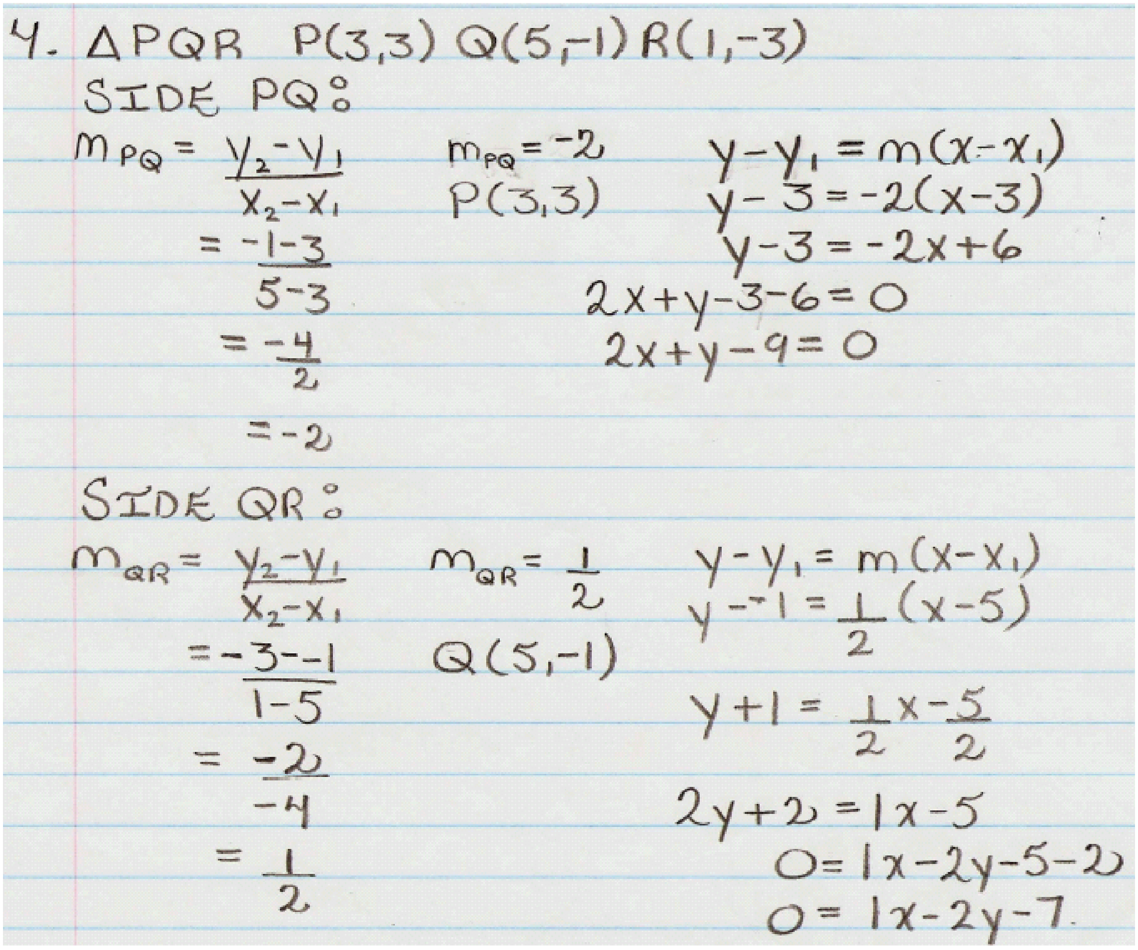
$= \frac{-6-8}{-2-2}$

$= \frac{-14}{-4}$

$= \frac{14}{4}$

$= \frac{7}{2}$

Since m_{AC} is the negative reciprocal of m_{BD}, the diagonals are perpendicular.



4. ΔPQR $P(3,3)$ $Q(5,-1)$ $R(1,-3)$

SIDE PQ:

$$m_{PQ} = \frac{y_2-y_1}{x_2-x_1}$$

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

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

$$= -2$$

$m_{PQ} = -2$

$P(3,3)$

$$y-y_1 = m(x-x_1)$$

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

$$y-3 = -2x+6$$

$$2x+y-3-6=0$$

$$2x+y-9=0$$

SIDE QR:

$$m_{QR} = \frac{y_2-y_1}{x_2-x_1}$$

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

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

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

$m_{QR} = \frac{1}{2}$

$Q(5,-1)$

$$y-y_1 = m(x-x_1)$$

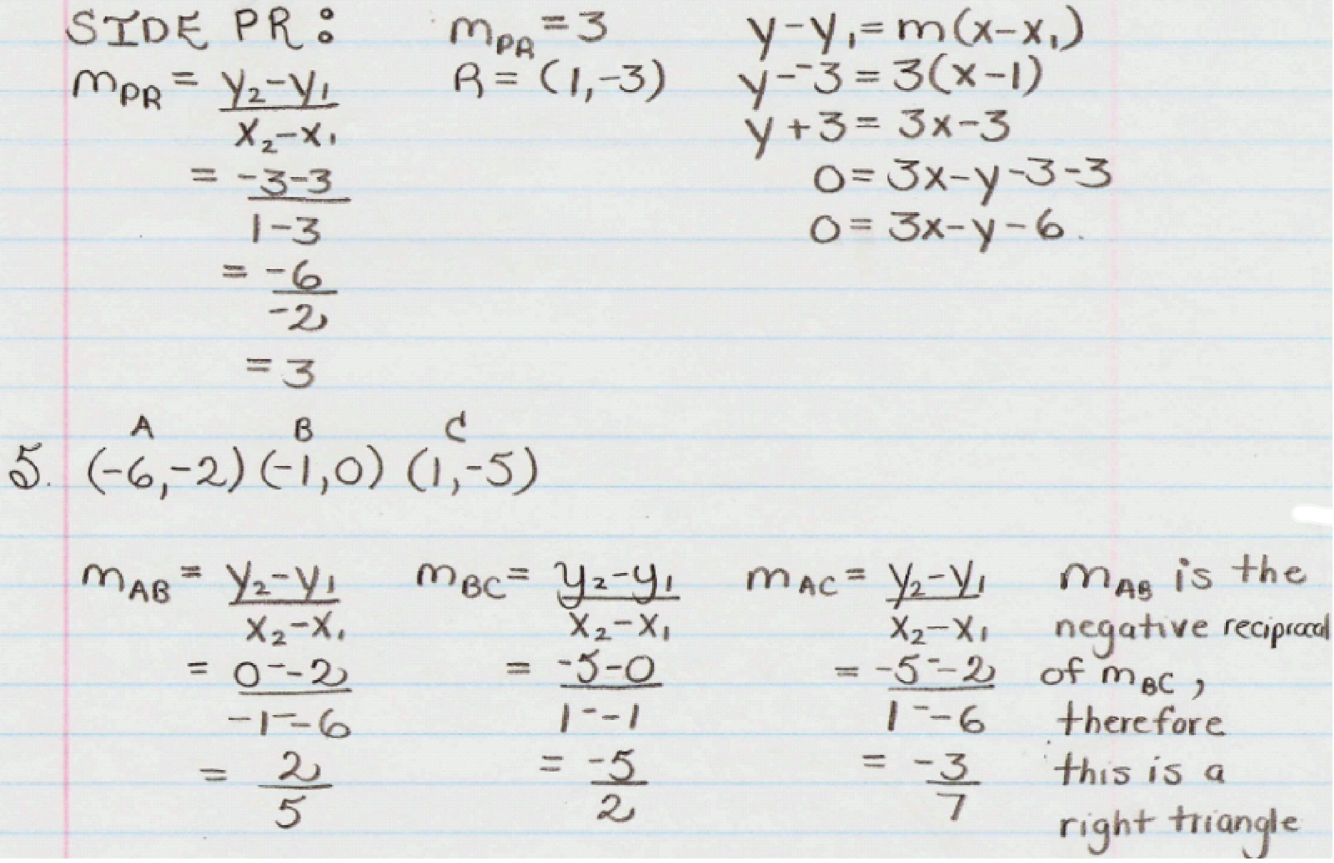
$$y--1 = \frac{1}{2}(x-5)$$

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

$$2y+2 = 1x-5$$

$$0=1x-2y-5-2$$

$$0=1x-2y-7.$$



SIDE PR:

$m_{PR} = \frac{y_2-y_1}{x_2-x_1}$

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

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

$= 3$

$m_{PR} = 3$

$R = (1,-3)$

$y-y_1 = m(x-x_1)$

$y-{}^-3 = 3(x-1)$

$y+3 = 3x-3$

$0 = 3x-y-3-3$

$0 = 3x-y-6.$

5. $\overset{A}{(-6,-2)}\ \overset{B}{(-1,0)}\ \overset{C}{(1,-5)}$

$m_{AB} = \frac{y_2-y_1}{x_2-x_1}$

$= \frac{0-{}^-2}{-1-{}^-6}$

$= \frac{2}{5}$

$m_{BC} = \frac{y_2-y_1}{x_2-x_1}$

$= \frac{-5-0}{1-{}^-1}$

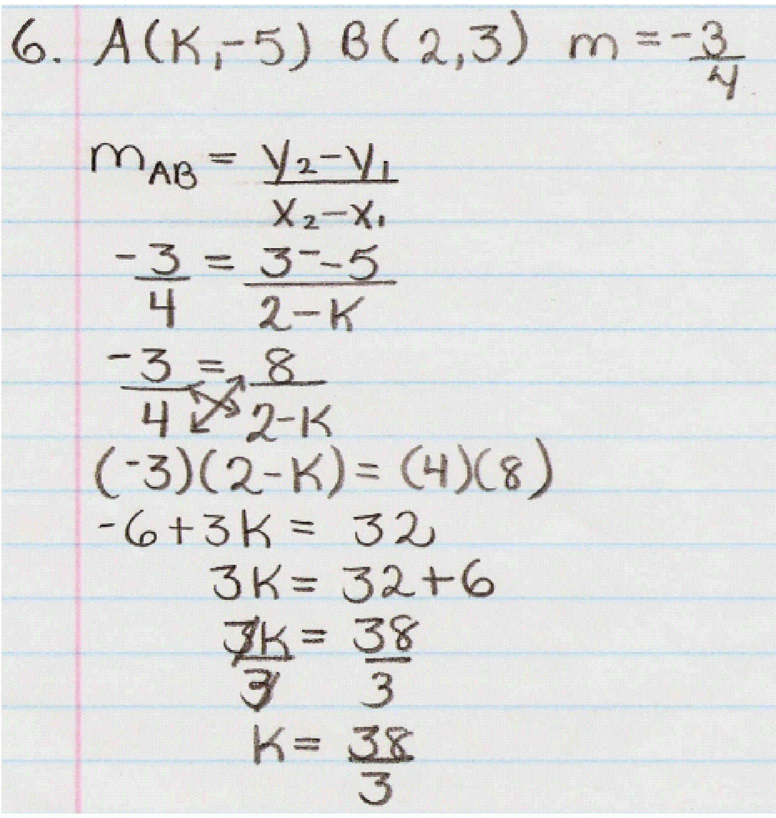
$= \frac{-5}{2}$

$m_{AC} = \frac{y_2-y_1}{x_2-x_1}$

$= \frac{-5-{}^-2}{1-{}^-6}$

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

m_{AB} is the negative reciprocal of m_{BC}, therefore this is a right triangle



6. $A(K,-5)$ $B(2,3)$ $m=-\frac{3}{4}$

$$m_{AB}=\frac{y_2-y_1}{x_2-x_1}$$

$$-\frac{3}{4}=\frac{3^{-}-5}{2-K}$$

$$-\frac{3}{4}=\frac{8}{2-K}$$

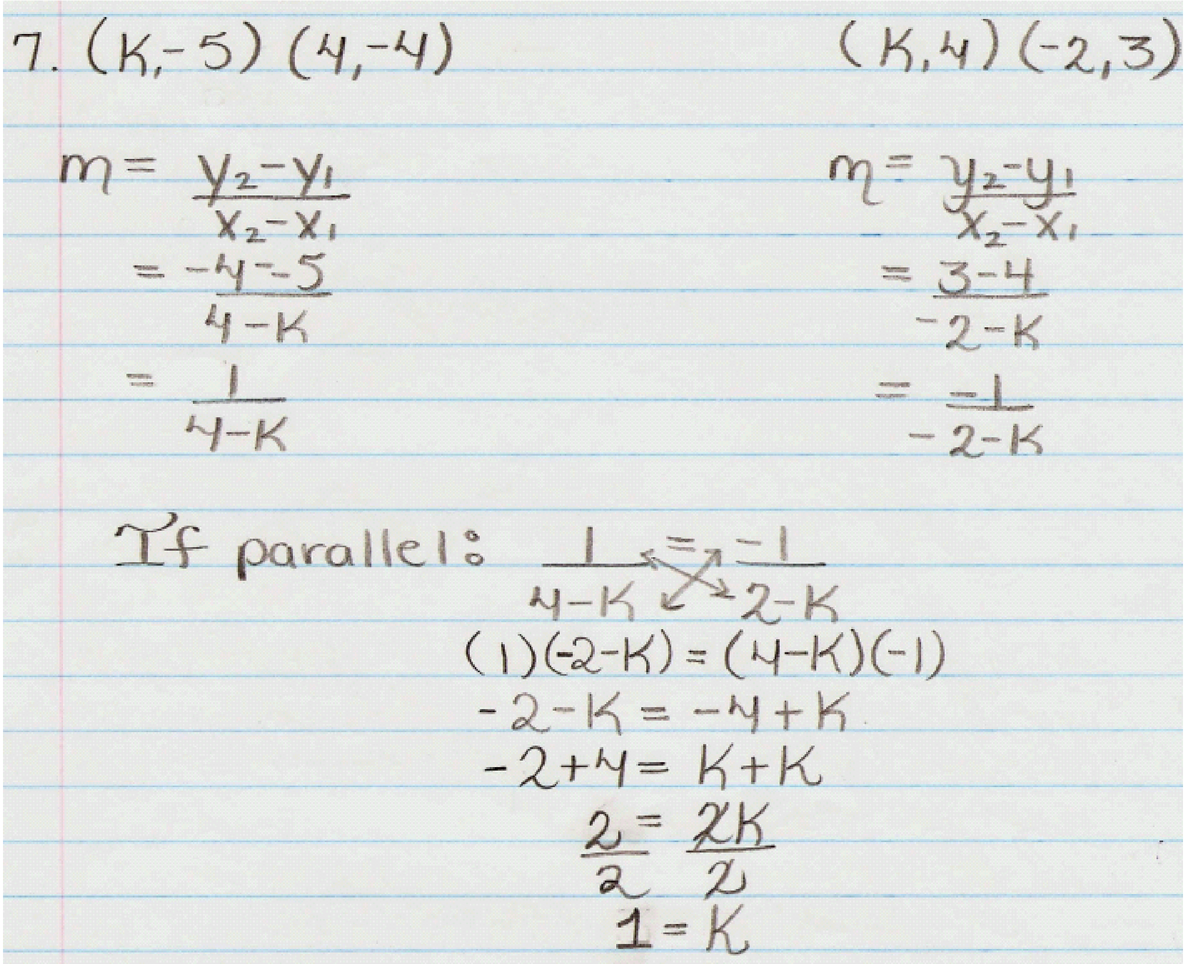
$$(^{-}3)(2-K)=(4)(8)$$

$$-6+3K=32$$

$$3K=32+6$$

$$\frac{\cancel{3}K}{\cancel{3}}=\frac{38}{3}$$

$$K=\frac{38}{3}$$



7. $(K,-5)\ (4,-4)$ $\qquad$ $(K,4)\ (-2,3)$

$$m = \frac{y_2-y_1}{x_2-x_1}$$

$$= \frac{-4--5}{4-K}$$

$$= \frac{1}{4-K}$$

$$m = \frac{y_2-y_1}{x_2-x_1}$$

$$= \frac{3-4}{-2-K}$$

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

If parallel: $\frac{1}{4-K} = \frac{-1}{2-K}$

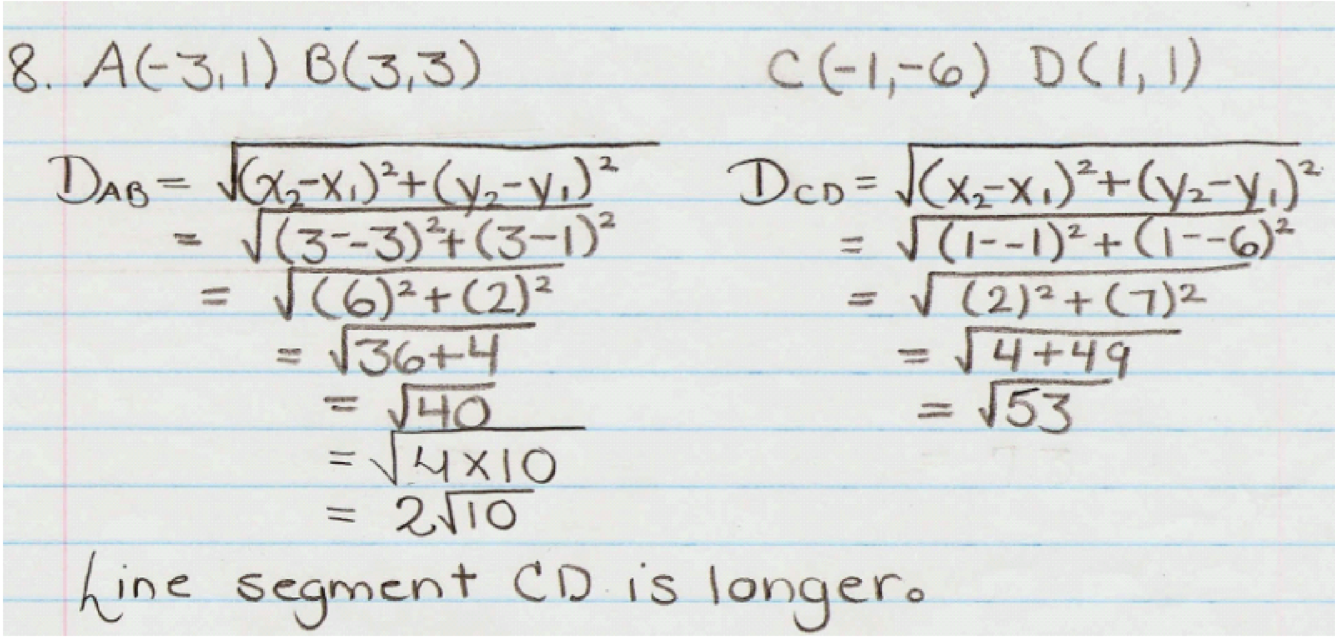
$$(1)(-2-K) = (4-K)(-1)$$

$$-2-K = -4+K$$

$$-2+4 = K+K$$

$$\frac{2}{2} = \frac{2K}{2}$$

$$1 = K$$



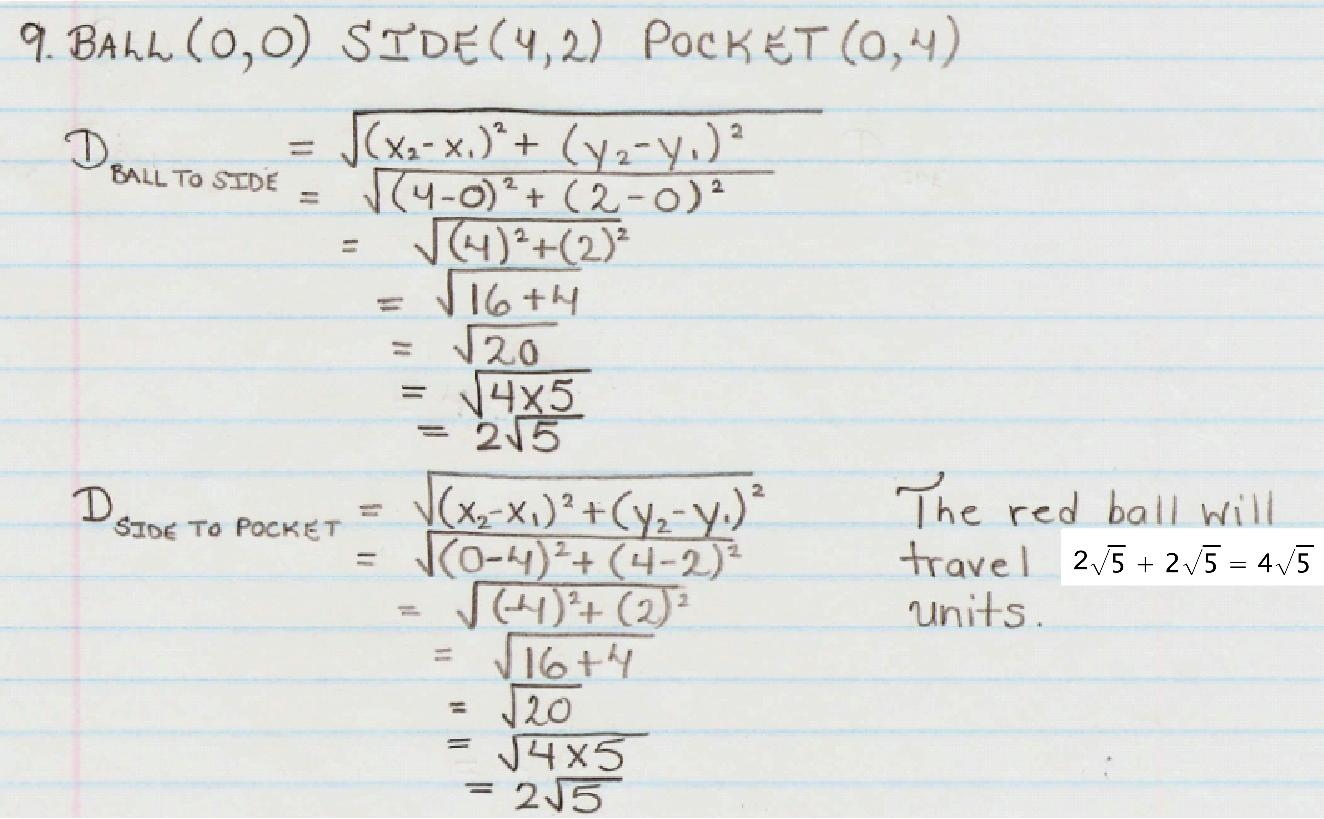
8. A(-3,1) B(3,3)

$$D_{AB} = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$
$$= \sqrt{(3--3)^2+(3-1)^2}$$
$$= \sqrt{(6)^2+(2)^2}$$
$$= \sqrt{36+4}$$
$$= \sqrt{40}$$
$$= \sqrt{4\times10}$$
$$= 2\sqrt{10}$$

C(-1,-6) D(1,1)

$$D_{CD} = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$
$$= \sqrt{(1--1)^2+(1--6)^2}$$
$$= \sqrt{(2)^2+(7)^2}$$
$$= \sqrt{4+49}$$
$$= \sqrt{53}$$

Line segment CD is longer.

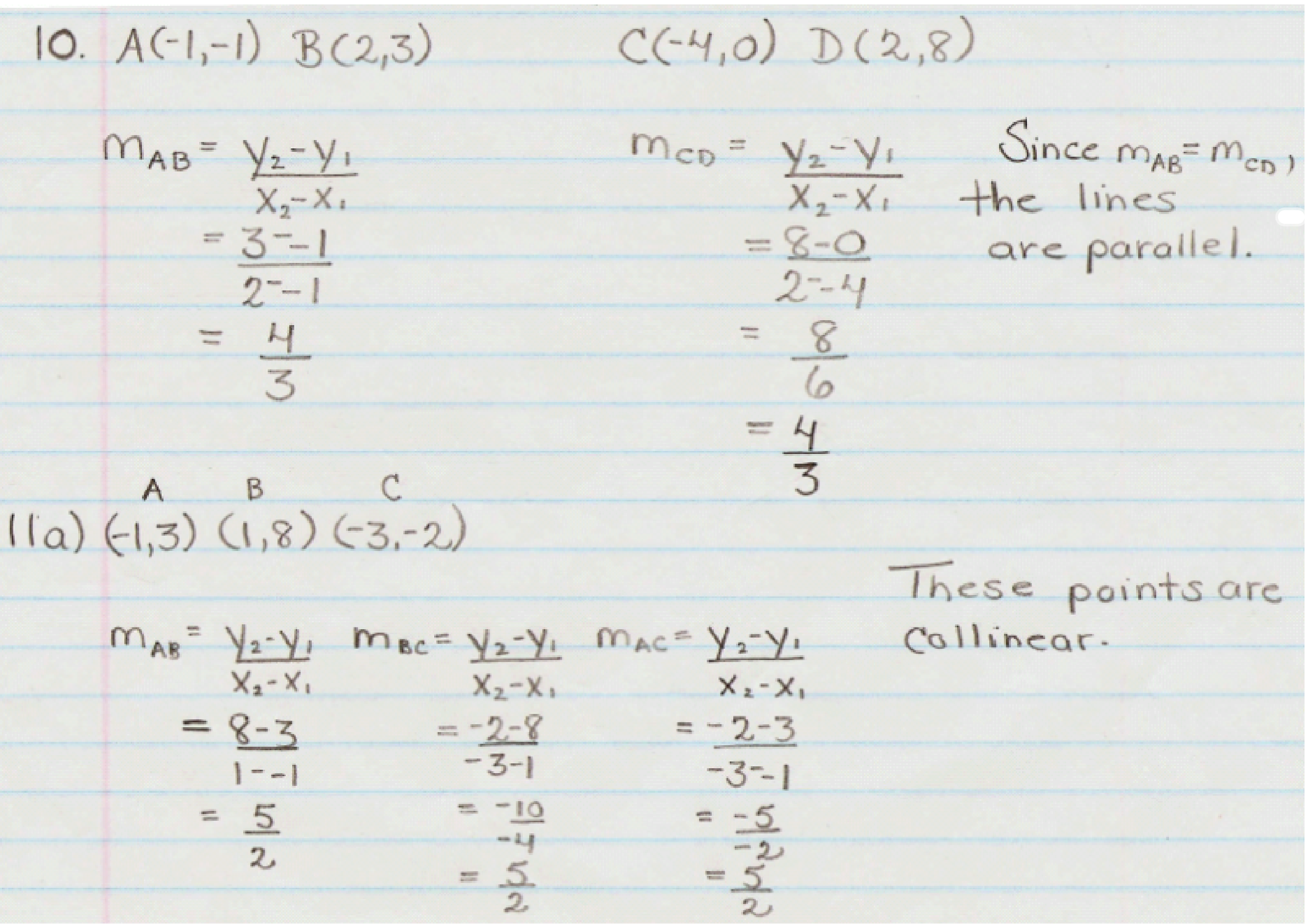


9. BALL (0,0) SIDE (4,2) POCKET (0,4)

$$
\begin{aligned}
D_{\text{BALL TO SIDE}} &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}\\
&= \sqrt{(4-0)^2+(2-0)^2}\\
&= \sqrt{(4)^2+(2)^2}\\
&= \sqrt{16+4}\\
&= \sqrt{20}\\
&= \sqrt{4\text{x}5}\\
&= 2\sqrt{5}
\end{aligned}
$$

$$
\begin{aligned}
D_{\text{SIDE TO POCKET}} &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}\\
&= \sqrt{(0-4)^2+(4-2)^2}\\
&= \sqrt{(-4)^2+(2)^2}\\
&= \sqrt{16+4}\\
&= \sqrt{20}\\
&= \sqrt{4\text{x}5}\\
&= 2\sqrt{5}
\end{aligned}
$$

The red ball will travel $2\sqrt{5} + 2\sqrt{5} = 4\sqrt{5}$ units.



10. A(-1,-1) B(2,3) C(-4,0) D(2,8)

$$m_{AB} = \frac{y_2-y_1}{x_2-x_1} = \frac{3^{-}-1}{2^{-}-1} = \frac{4}{3}$$

$$m_{CD} = \frac{y_2-y_1}{x_2-x_1} = \frac{8-0}{2^{-}-4} = \frac{8}{6} = \frac{4}{3}$$

Since $m_{AB} = m_{CD}$, the lines are parallel.

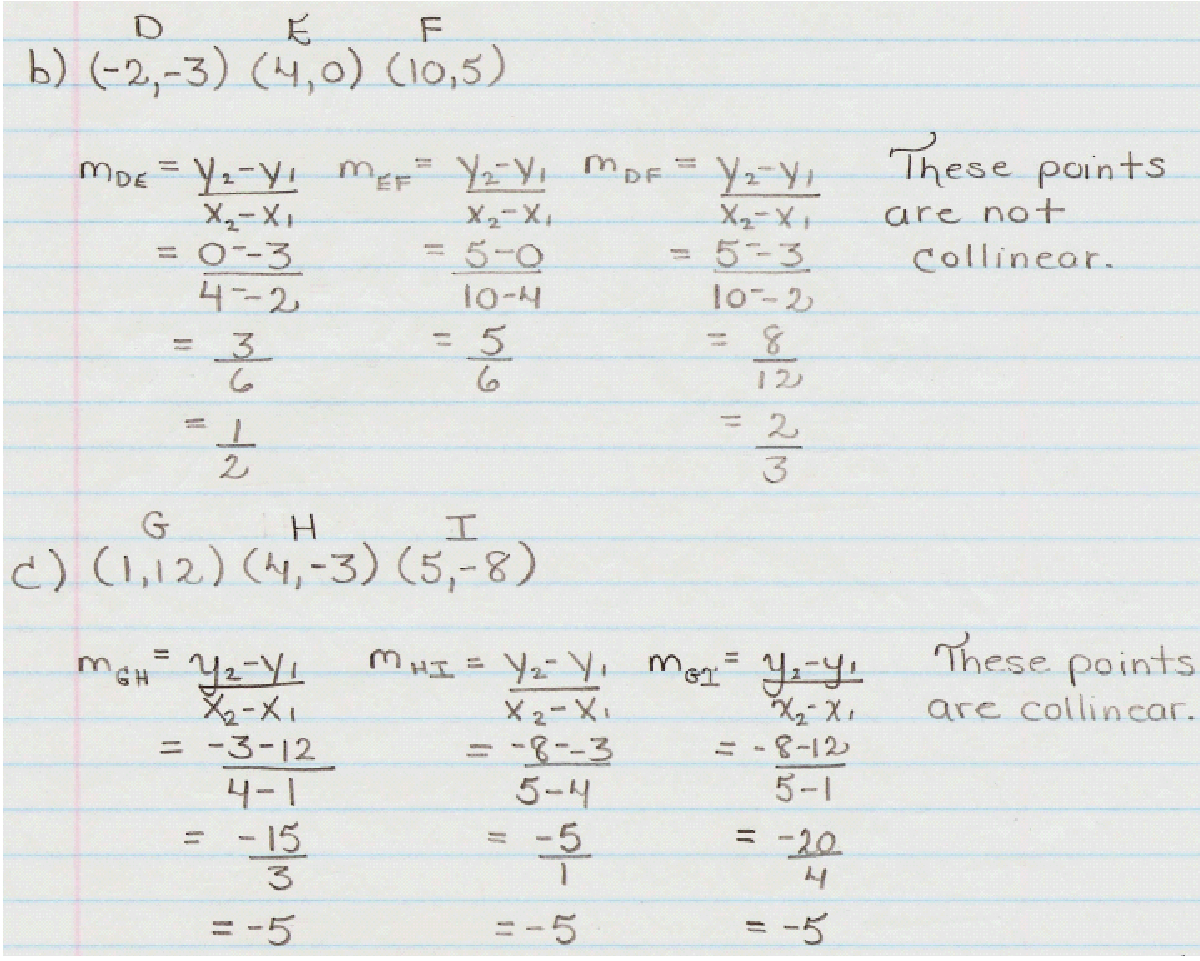
11a) $\overset{A}{(-1,3)}$ $\overset{B}{(1,8)}$ $\overset{C}{(-3,-2)}$

$$m_{AB} = \frac{y_2-y_1}{x_2-x_1} = \frac{8-3}{1--1} = \frac{5}{2}$$

$$m_{BC} = \frac{y_2-y_1}{x_2-x_1} = \frac{-2-8}{-3-1} = \frac{-10}{-4} = \frac{5}{2}$$

$$m_{AC} = \frac{y_2-y_1}{x_2-x_1} = \frac{-2-3}{-3^{-}-1} = \frac{-5}{-2} = \frac{5}{2}$$

These points are collinear.



D E F

b) (-2,-3) (4,0) (10,5)

$$m_{DE} = \frac{y_2-y_1}{x_2-x_1} = \frac{0--3}{4--2} = \frac{3}{6} = \frac{1}{2}$$

$$m_{EF} = \frac{y_2-y_1}{x_2-x_1} = \frac{5-0}{10-4} = \frac{5}{6}$$

$$m_{DF} = \frac{y_2-y_1}{x_2-x_1} = \frac{5--3}{10--2} = \frac{8}{12} = \frac{2}{3}$$

These points are not collinear.

G H I

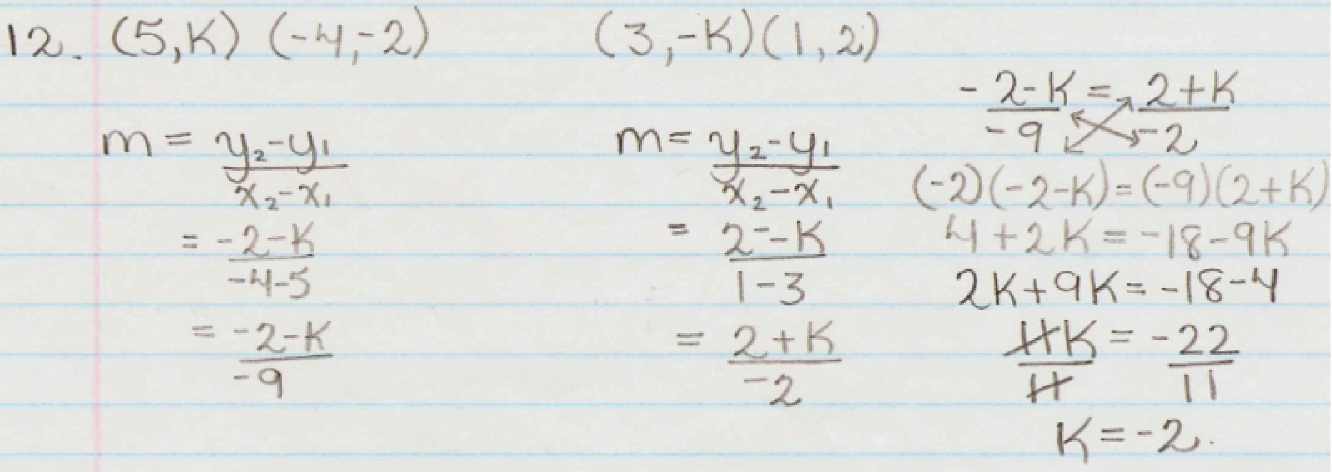
c) (1,12) (4,-3) (5,-8)

$$m_{GH} = \frac{y_2-y_1}{x_2-x_1} = \frac{-3-12}{4-1} = \frac{-15}{3} = -5$$

$$m_{HI} = \frac{y_2-y_1}{x_2-x_1} = \frac{-8--3}{5-4} = \frac{-5}{1} = -5$$

$$m_{GI} = \frac{y_2-y_1}{x_2-x_1} = \frac{-8-12}{5-1} = \frac{-20}{4} = -5$$

These points are collinear.



12. (5,K) (-4,-2)

$$m = \frac{y_2-y_1}{x_2-x_1}$$

$$= \frac{-2-K}{-4-5}$$

$$= \frac{-2-K}{-9}$$

(3,-K)(1,2)

$$m = \frac{y_2-y_1}{x_2-x_1}$$

$$= \frac{2--K}{1-3}$$

$$= \frac{2+K}{-2}$$

$$\frac{-2-K}{-9} = \frac{2+K}{-2}$$

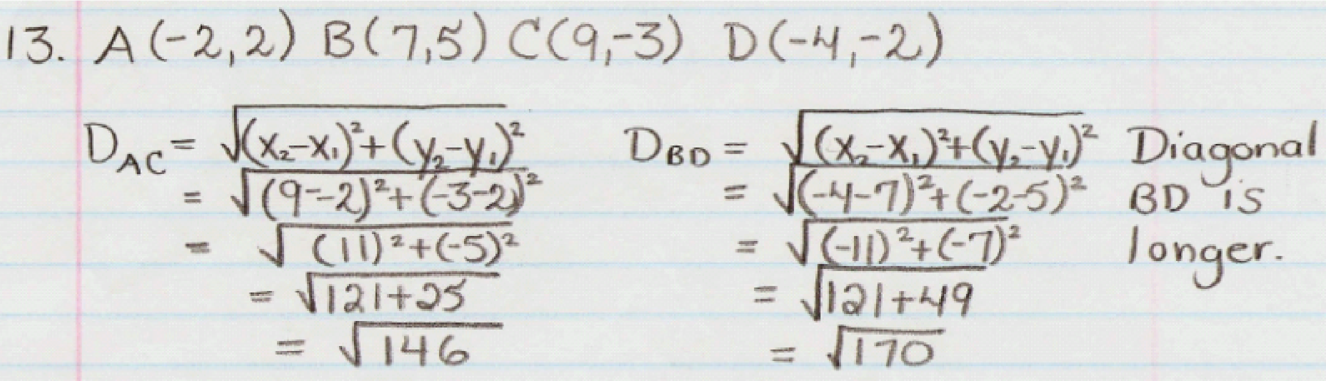
$$(-2)(-2-K) = (-9)(2+K)$$

$$4+2K = -18-9K$$

$$2K+9K = -18-4$$

$$\frac{\cancel{11}K}{\cancel{11}} = \frac{-22}{11}$$

$$K = -2.$$

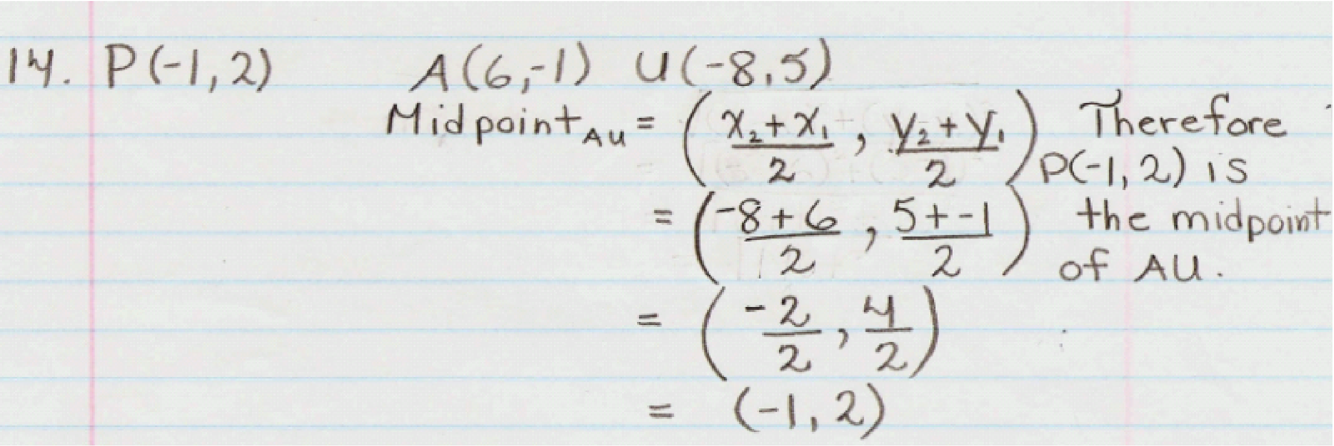


13. A(-2,2) B(7,5) C(9,-3) D(-4,-2)

$$D_{AC} = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$
$$= \sqrt{(9--2)^2+(-3-2)^2}$$
$$= \sqrt{(11)^2+(-5)^2}$$
$$= \sqrt{121+25}$$
$$= \sqrt{146}$$

$$D_{BD} = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$
$$= \sqrt{(-4-7)^2+(-2-5)^2}$$
$$= \sqrt{(-11)^2+(-7)^2}$$
$$= \sqrt{121+49}$$
$$= \sqrt{170}$$

Diagonal BD is longer.



14. P(-1, 2)   A(6,-1) U(-8,5)

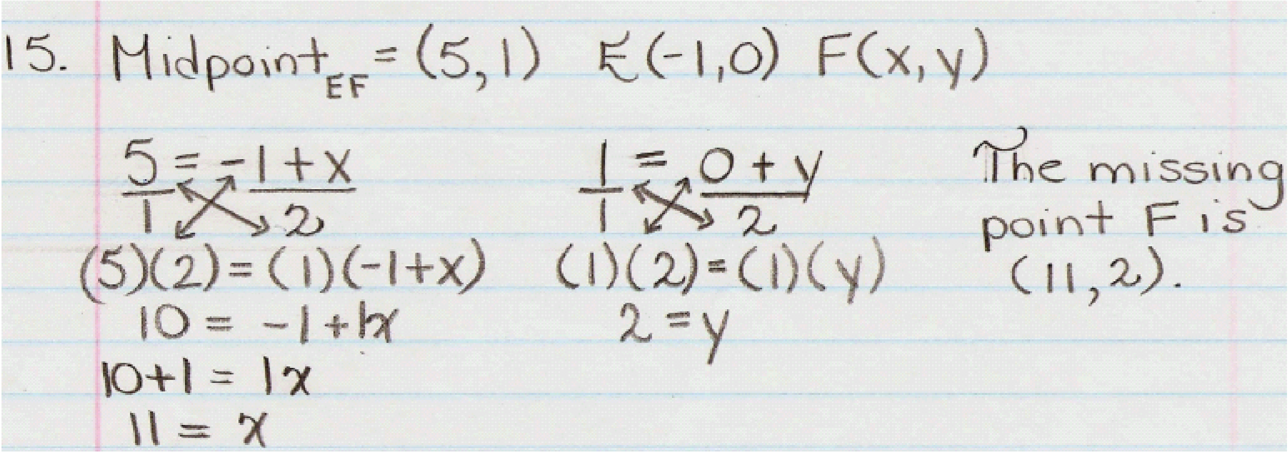
$$\text{Midpoint}_{AU} = \left(\frac{x_2+x_1}{2}, \frac{y_2+y_1}{2}\right)$$

$$= \left(\frac{-8+6}{2}, \frac{5+-1}{2}\right)$$

$$= \left(\frac{-2}{2}, \frac{4}{2}\right)$$

$$= (-1, 2)$$

Therefore P(-1, 2) is the midpoint of AU.



15. Midpoint$_{EF}$ = (5,1) E(-1,0) F(x,y)

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

$(5)(2) = (1)(-1+x)$

$10 = -1+1x$

$10+1 = 1x$

$11 = x$

$\frac{1}{1} = \frac{0+y}{2}$

$(1)(2) = (1)(y)$

$2 = y$

The missing point F is (11, 2).